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E. H. Embley Memorial Lecture.¹

THE INFLUENCE OF PHYSIOLOGY AND PHARMACOLOGY ON THE ADVANCEMENT OF ANAESTHESIA.

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TODAY we are paying tribute to the memory of Edward Henry Embley, a medical practitioner who, in his spare time, worked in the Physiology Department of the University of Melbourne. He was the first Australian anaesthetist to win world recognition for his physiological and pharmacological investigations. Since Embley retired from practice in 1920 and died in 1924, I have no personal knowledge of him. However, at the time when I was serving as an undergraduate student in physiology and pharmacology, his important contributions were still fresh in the minds of my teachers. Later, as the result of a combination of circumstances associated with the outbreak of the second World War, Embley's scientific apparatus

came into my care. It had been preserved in a box at the Physiology Department, and it was with this equipment that his important work on chloroform had been performed. It did not consist of any elaborate electronic recording device such as we should expect today, but of a few simple test tubes, pipettes and odd lengths of glass tubing showing evidence of amateur attempts at glass blowing. With this apparatus he had disproved the findings of the Hyderabad Commission set up to investigate deaths under chloroform anaesthesia, and he had shown that far-reaching results could be obtained with little cost other than of time and energy.

Looking through the published works of Embley, my attention was caught by two titles, "The Causation of Death during the Administration of Chloroform" (1902) and "The Pharmacology of Ethyl Chloride" (1906). Accordingly, it seemed appropriate to talk this evening on the influence of physiology and pharmacology on the advancement of anaesthesia.

In speaking of anaesthesia tonight, I propose to use the word in its wider meaning so as to include subjects which, strictly, should be termed analgesia. I hope I shall be forgiven if I refer to local and spinal anaesthesia.

The development of local anaesthetic agents has always been in the hands of pharmacologists. Cocaine was isolated by Niemann in 1860, who noted that it produced numbness of the tongue. Van Antrep, in 1879, injected it under the skin and observed the loss of sensation. These men

¹Read at a meeting of the Victorian Branch of the British Medical Association on August 7, 1957.

were pharmacologists and the properties of cocaine were known when, in 1884, Köller, a clinician, demonstrated the use of cocaine in ophthalmic surgery. Chemical search for cocaine substitutes then began and has gone on continuously since. "Stovaine" was introduced by Fournneau in 1904, its title being a pun on the translation of Fournneau into the English word "stove". "Novocain" was synthesized by Einhorn in 1905, "Percaïne" by Meischer in 1929, and lignocaine by Löfgren in 1948, to quote a few well-known examples of local anæsthetic agents. The development of these drugs not only hastened the evolution of local techniques, but paved the way for the introduction and perfection of spinal, caudal and epidural anæsthesia. Thus by 1885 Corning had used a form of spinal anæsthesia in dogs with cocaine as the agent. This was followed in 1899 by the demonstration of spinal anæsthesia in a human subject by Bier.

Turning to the field of general anæsthesia, we find the names of many famous physiologists associated with the early history. At that time pharmacology and physiology were closely linked, and it is not surprising to find that some of the earliest published works came from the pen of Claude Bernard. Probably the first monograph on anæsthesia was written by this famous physiologist; it was entitled "Lecture on Anæsthesia and Asphyxia", and was published in 1875.

It must not be forgotten, however, that some eighteen years earlier he had already published a monograph on curare; but this drug was to wait many years before it was introduced into clinical anæsthesia.

Prior to the work of Bernard, the theory of the action of anæsthetic agents was that of asphyxia. Though his theory of the coagulation of nerve tissues may not be accepted today, nevertheless it showed the way for future research. His pupil Paul Bert (1878) demonstrated that it was possible to avoid asphyxia with nitrous oxide by the addition of oxygen. By using a pressure chamber, he showed that the anæsthetic effect of nitrous oxide depended on the partial pressure at which it was administered, and not on the percentage in the mixture. This fact has been rediscovered in much more recent times.

As has already been mentioned, it was Embley who first placed the investigation of death under chloroform anæsthesia on a physiological basis. He showed that death was due to heart failure brought about by sensitization of heart muscle and by increased irritability of the vagus nerve. This work was extended by Levy (1911), who demonstrated the occurrence of adrenaline-produced ventricular fibrillation, and finally settled the chloroform controversy.

The introduction of ethylene into clinical medicine was due to investigations by numerous physiologists. Probably the most important contribution came from an unlikely source. Crocker and Knight, in 1908, had studied the toxic effects of ethylene on carnations, the ethylene being present in the gas used to warm the greenhouses. Accordingly, in 1918, Luckhardt and Thompson (1924) investigated the anæsthetic properties of mixtures of ethylene and oxygen in animals. After World War I, Luckhardt and Carter (1923) resumed the work, experimenting on themselves and finally administering ethylene to patients.

Divinyl ether is an example of an agent which was prepared after its possible properties had been forecast. Chen and Leake (1930) suggested that a hybrid molecule combining the structural characteristics of ethylene and ethyl ether might have anæsthetic properties. As the result of this, Ruigh and Major (1931) prepared divinyl ether and sent it to Leake, who investigated its effect on animals (Leake *et alii*, 1933).

Cyclopropane was isolated as an anæsthetic agent when Lucas and Henderson (1929, 1930) were investigating the cardio-toxic properties of propylene. They showed that the cardiac damage came from cyclopropane present as an impurity. However, when this, suitably diluted with oxygen, was administered to experimental animals, it became a potent anæsthetic with many desirable properties.

In the development of anæsthesia produced by intravenous administration, the pharmacologist has played an important role. The first monograph on intravenous anæsthesia appeared from the pen of Pierre-Cyprien Oré in 1875, and the drug he used was chloral hydrate. However, it was the development of barbitone by Emil Fischer in 1902 (Fischer and Mering, 1903) that paved the way for modern methods. Milestones in this development were the introduction of "Evipan" in 1932 and "Pentothal Sodium" in 1934.

The properties of curare were originally described by Claude Bernard (1865), and impure forms were utilized by physiologists for many years. Finally it was introduced into clinical anæsthesia by Griffith and Johnson in 1942. The production of synthetic muscle relaxants and their investigation by pharmacologists has played an important part in the development of what is commonly called "modern anæsthesia".

So far, I have dealt in the main with the introduction of various agents capable of producing anæsthesia or of aiding the anæsthetist to provide satisfactory operating conditions. I wish now to turn to the methods of administration, and to trace the influence of physiology and pharmacology on the development of modern techniques, such as those which are required today in thoracic surgery and neurosurgery. Much of this development has been related to endotracheal anæsthesia, and this will be considered as part of the technique.

Vesalius, as far back as 1543, kept an animal alive, in spite of an open thorax, by blowing air into its trachea. John Snow in 1852 demonstrated endotracheal anæsthesia by inhalation (Snow, 1858). He performed a tracheotomy on a rabbit, inserted a wide-bore tube and connected it to a bag containing chloroform vapour. The early work on both endotracheal anæsthesia and artificial respiration closely resembled modern methods of controlled respiration using wide-bore tubes. By 1911, Kühn had published results that foreshadowed our present ideas. However, it was the physiologists Meltzer and Auer (1909) who side-tracked anæsthetists by the report of their work on endotracheal insufflation. This method was to dominate the field until after the first World War, when Rowbotham and Magill (1921) reintroduced inhalational endotracheal anæsthesia and paved the way for the development of controlled respiration.

As might be expected, anæsthetists have always displayed a marked interest in respiration; but it was when the surgeons wished to invade the thorax that they were faced with the problems of open pneumothorax. Here, once more, we find that the first introduced method was the most physiological. However, it was abandoned for many years before its ultimate revival and general adoption.

Fell, as early as 1887, used a method of lung inflation by means of a face mask and bellows. This was modified by Matas (1899, 1900) to employ a laryngeal tube, so that in 1899 he was able to perform a thoracotomy. His description reads as follows:

The procedure that promises the most benefit in preventing pulmonary collapse in operations on the chest is the artificial inflation of the lung and the rhythmical maintenance of artificial respiration by a tube in the glottis directly connected with a bellows. Like other discoveries, it is not only elementary in its simplicity, but the fundamental ideas involved in this important suggestion have been lying idle before the eyes of the profession for years. It is curious that surgeons should have failed to apply for so long a time the suggestions of the physiological laboratory, where the bellows and tracheal tubes have been in constant use from the days of Magendie to the present in practising artificial respiration in animals.

These remarks were published not in 1940, but in 1899.

In France, by 1896, Tuffier and Hallion had introduced a system of rhythmic inflation with regulated escape pressure, the valve being identical in principle to one described by Neff in 1945 (Neff and Lind, 1945). However, the thinking of that period was dominated by a report to the French Academy of Science, which con-

demned the use of bellows, and by the frequently expressed opinion that routine intubation of the larynx was not a practical procedure. Consequently, the highly satisfactory methods of the physiological laboratory were abandoned, and the search was begun for other methods of combating the problems of the open thorax. Attention became focused on pulmonary collapse as the cause of the disturbance, and attempts were made to maintain the lung fully inflated. Sauerbruch, a pupil of von Mikulicz, was foremost in propounding this theory, and he developed a negative pressure chamber which accommodated the body of the patient and the surgeon (Sauerbruch and O'Shaughnessy, 1937). The head of the patient and the anaesthetist remained outside. In this way it was possible to keep the lung inflated in spite of the open thorax. A succession of larger and more complex chambers were designed, culminating in those of Meyer and of Robinson. Fortunately, it was realized that the same results could be achieved by applying positive pressure to the bronchial tree as by applying negative pressure to the open thorax, and machines were designed to provide controlled positive pressure. A period of some ten years elapsed, during which various methods of differential pressure were employed, at first for short operations, but later the times were extended. Two distinct principles were developed. In one method, mixtures of gases were delivered to a face mask at a pressure above that of the atmosphere. A typical, though late, example of this apparatus was the McKesson intermittent flow machine. In the other method, air or oxygen laden with ether was delivered through a fine catheter into the trachea, the method being known as endotracheal insufflation anaesthesia. The equipment used in these two methods differed greatly, but on closer examination the results were the same. In both cases, after the thorax had been opened, the lungs were maintained in an inflated state, and though inspiration was assisted by the positive pressure, expiration was impeded.

By 1910 we find Meyer (Mushin and Rendell-Baker, 1953) describing the sequence of events in a patient who had undergone oesophagectomy under positive-pressure anaesthesia with nitrous oxide and oxygen; at the end of the operation:

The patient is taken out of apparatus with lips red, pure oxygen having been administered during last 1½ hours; as soon as the head is removed from the apparatus, his hitherto red lips turned a deep blue.

The patient expired about ten minutes after completion of the dressings.

Meyer turned to the works of the physiologists Verworn and Volhard for an explanation. He realized that carbon dioxide accumulation was the cause, and recommended intermittent deflation of the lungs as a preventive. This amounted to a form of assisted or controlled respiration, which is in common use today. In Meyer's own words:

It is necessary in the course of thoracic operations of long duration to interrupt now and then the pressure, allowing the lungs to collapse; in other words, to interpose at regular intervals brief periods of artificial respiration by means of the apparatus, in order to clear the system of its CO_2 accumulation.

The use of insufflation endotracheal anaesthesia demonstrates once more how the clinician departed from the original physiological principles with disastrous results. Meltzer and Auer entitled their paper "Continuous Respiration without Respiratory Movements". They aimed at the production of apnoea by removal of carbon dioxide, though it must be admitted that, from their description, deep anaesthesia cannot be excluded. It seems probable that when Elsberg (1910) modified the method for clinical use, he ignored the physiological principle of adequate removal of carbon dioxide. There seems to be little doubt that his equipment, when used for long intrathoracic operations, resulted in carbon dioxide retention and the same bad results as with other forms of positive-pressure anaesthesia.

In the field of experimental surgery, rhythmic lung inflation was being used by Green in the year 1906, and in clinical anaesthesia by Janeway in 1909. About that time

we find Janeway (Mushin and Rendell-Baker, 1953) writing as follows:

During an operation for empyema in a child, whenever this device was utilized, the diaphragm and intercostal muscles remained at rest. This contrasted strongly with the respiratory efforts which occurred as soon as the valves were turned which permit a change to the maintenance of a constant positive pressure. We desire to lay special stress on this point, because the absence of muscular movements during operations in the thoracic cavity contributes in an important degree to the speed and ease of the operation.

And so the way lay open, by 1909 at the latest, for the employment of controlled respiration in thoracic surgery, but many years were to pass before it received widespread acceptance.

A technique which has done much to advance anaesthesia has been that of carbon dioxide absorption. Though John Snow introduced it in 1850, it was Dennis Jackson (1915), working in a department of physiology, who did much to bring it to the notice of anaesthetists. Finally, Waters, of Madison, introduced it into clinical anaesthesia in 1923 (Waters, 1924).

It is necessary to pause for a moment and consider why this method has been important. Prior to this the anaesthetist, in his attempt to conserve gases, had used rebreathing and had considered carbon dioxide a valuable respiratory stimulant. In the presence of respiratory depression, his first reaction was to accumulate or add carbon dioxide in order to restore normal ventilation. This idea came as the result of the published works of Yandell Henderson (1938) in America and of J. S. Haldane in Britain during the years 1925 and 1926. This period saw the introduction and widespread use of mixtures of oxygen and carbon dioxide in clinical medicine. At that time, and for some years after, it was common to see "Carbogen" cylinders attached to anaesthetic machines. The presence of a rotameter to measure carbon dioxide on the present-day Boyle's machine must be a relic of that time. The introduction of the carbon dioxide absorption technique focused attention on carbon dioxide removal, and the anaesthetist realized for the first time that not carbon dioxide, but oxygen, was the requirement of the patient with depressed respiration.

Now the anaesthetist started to become a physiologist in his own right. The academic physiologist, working on animals with normal respiratory responses, was accustomed to think of carbon dioxide as a respiratory stimulant. To him, a rise in arterial carbon dioxide tension meant an increase in pulmonary ventilation. Now, however, the anaesthetist realized that in the anaesthetized patient the position was very different. Most anaesthetic agents depressed the respiratory centre and caused a decrease in respiratory volume. From this there came a rise in arterial carbon dioxide tension. This high level meant not over-ventilation, but under-ventilation.

Guedel and Treweek, in 1934, were the first anaesthetists to produce deliberate apnoea by hyperventilation of a patient connected to a closed anaesthetic system employing soda lime as a carbon dioxide absorbent. Waters, in 1936, first used the term "controlled respiration" for the technique. Although Crafoord described the method in detail in 1938, it was the publication of Nosworthy's paper in 1941 that established the method as the basis of modern anaesthesia, for without this development the muscle relaxants could not have been safely and adequately employed.

The history of muscle relaxants shows the great role that physiologists and pharmacologists have played in the development of anaesthesia. Claude Bernard, in 1840, proved that curare acted by paralyzing the myo-neural junction. In 1935, King isolated the active principle, *d*-tubocurarine, from crude curare, and ultimately the drug was introduced into anaesthesia by Griffith and Johnson in 1942.

Curare had been used by physiologists on animals for 100 years, and numerous writers on anaesthesia had suggested its use on humans. But it was only when the pure basic drug was isolated that clinical use was justified.

From then onwards the pharmacologists developed and evaluated synthetic muscle relaxants for the anaesthetist to employ. Bovet and Halpern, in 1947, prepared "Flaxedil", Barlow and Ing, in 1948, decamethonium, and Bovet, in 1949, euxamethonium. Today the anaesthetist has at his disposal a series of drugs varying in their duration of action, so that it is possible to select a preparation suitable for the problem at hand. In the same way antagonists are being developed, and the pharmacology department of the University of Melbourne is playing its part in this work.

The publication by Dripps, in 1947, of a paper dealing with cyclopropane shock, drew anaesthetists' attention to the importance of carbon dioxide retention not only during cyclopropane anaesthesia, but with all forms which depressed respiration. The gross changes in blood pH that took place in deep anaesthesia were stressed, and the answer was already available. Controlled or assisted respiration would maintain normal ventilation and prevent the fall in blood pH. Strangely, Dripps himself and many of his American associates were unwilling to use this remedy. They considered that the abolition of voluntary respiration was too high a price to pay for the cure. In Britain and Australia, however, it was adopted with enthusiasm, and the syndrome of cyclopropane shock disappeared.

The anaesthetist, having acquired some slight knowledge of physiology and pharmacology, now set forth on a series of exploratory adventures. Not satisfied with controlling the respiratory centre, he turned his attention to the cardio-vascular system. It has always been the desire of the surgeon to operate in a bloodless field, so for once the surgeon and the anaesthetist were in agreement. In 1948, Griffith and Gillies produced deliberate hypotension by inducing total spinal anaesthesia; in 1951, Bromage employed high extradural block (Bromage, 1954); and in the same year Enderby and Armstrong Davidson used ganglion-blocking agents. The pharmacologists made available, in turn, pentamethonium, hexamethonium, pentolinium, pendiolamide and trimetaphan. The physiological principle upon which the use of the drugs was based was that of vasodilatation with lowering of peripheral vascular resistance and consequent fall in blood pressure. However, many anaesthetists ignored this principle, adding posture to the process, so that vital organs, and particularly the brain, were deprived of adequate blood supply. Disasters followed, and a return to more rational methods was necessary.

We now entered a period in which surgeons wished to embark upon intracardiac surgery. This demanded the removal of the heart from the circulation for a period of time sufficiently long to allow the performance of operations within the heart. Two alternatives received consideration—first, that of lowering metabolism by hypothermia, and secondly, the employment of artificial heart-lung machines.

The physiological investigation into the effects of cold on the human body had been going on for many years; but Bigelow, of Canada, conducted in 1950 the first series of experiments aimed at determining the scope of the method for cardiac surgery. He established the facts that temperature and oxygen consumption showed a linear relationship, and that the control of shivering was of fundamental importance.

One of the major disadvantages of hypothermia was the occurrence of ventricular fibrillation, particularly if the ventricles of the heart were disturbed. Extensive investigation of the problem was made in physiology laboratories throughout the world, in an endeavour to determine whether there was a relationship between the metabolic disturbances under hypothermia and the onset of ventricular fibrillation. The workers at Denver, headed by Swan, incriminated respiratory acidosis, and once more the anaesthetist was called upon to provide the hyperventilation necessary to avoid it. Simultaneously, means were sought to reverse the fibrillation when it occurred. And so we find electrical defibrillators emerging from the

workshops of physiology departments to become clinical tools.

Though periods of up to twenty minutes' circulatory occlusion had been hoped for from hypothermia, it soon became evident that, for safety, temperatures below 30° C. had to be avoided, and periods longer than seven minutes were not possible. With this severe limitation, other methods were sought and heart-lung machines were developed.

To provide a bloodless field for intracardiac surgery, all blood must be prevented from returning to the heart. At first sight it would appear necessary only to replace the two sides of the heart with pumps. But this requires such extensive vascular surgery on the *venae cavae*, aorta, pulmonary artery and pulmonary vein that it is usual to remove the lungs from the circulation as well. In this, cannulation of the *venae cavae* and a major branch of the aorta will provide the necessary connexions. If now the heart is brought to arrest and the aorta clamped beyond the coronary orifices, blood ceases to flow into the heart through the coronary sinus and a dry field results.

In theory this proposal seems simple. But the oxygenation of a large volume of blood is difficult, so that compromises have resulted. Departure from physiological principles has been necessary, and blood flow has been reduced below normal levels. As might be expected, gross metabolic disturbances appear in the patient, and with these the anaesthetist has to contend. If cerebral damage is to be avoided, it is essential for the brain to be supplied with adequate oxygen. With the heart-lung machine at least three factors are present which affect this supply: first, the oxygenator must add sufficient oxygen to the blood passing through it; secondly, the blood must be supplied to the brain at an adequate pressure; thirdly, the correct amount of carbon dioxide must be removed from the blood.

The problem of oxygenation has been solved in most machines either by spreading the blood in molecular films or by dispersing the oxygen as bubbles. The pressure at which the blood is supplied to the brain is determined by the output of the machine and by the degree of vasoconstriction present in the patient. Since with some of the machines available it is necessary to restrict the blood flow, then it is essential to employ some agent which will constrict blood vessels other than those of the brain. The pharmacologists have provided such a drug in nor-adrenaline, and the blood flow to the brain is maintained in spite of a diminished total output by the addition of nor-adrenaline to the circulation. When we come to consider the question of carbon dioxide removal, we meet a problem, the solution of which has thrown considerable light on past anaesthetic difficulties. With most of the oxygenators available, it is easy to remove too much carbon dioxide from the blood, so that the arterial tension falls below normal. But a low arterial tension of carbon dioxide causes constriction of the cerebral vessels, and the dangerous combination appears of low blood pressure and vasoconstriction in the brain. Cerebral damage results. In the investigation of the problems associated with extracorporeal circulations, physiologists have played a vital part. But these men have worked not so much in academic centres as in close contact with clinical institutions. Men such as Lillehei at Minneapolis and Kirklin at Rochester are not just surgeons solving surgical problems, but physiologists and pharmacologists combining clinical observations with animal research. Working as integral parts of these teams are anaesthetists, sharing the problems and adding their contributions to the knowledge.

Though it may appear at first sight that the problems of open heart surgery are of a special nature, nevertheless some of the results have a direct bearing on everyday anaesthesia. Two factors have influenced the duties of the present-day anaesthetist. The improvement in the standard of his administrations has made conditions operable which a few years ago would never have reached the hands of the surgeon. Also, the expectation of life has risen, and we are meeting many patients of advanced ages.

Whilst healthy young patients will tolerate considerable disturbance of metabolism with little ill effect, the elderly, poor-risk individuals will not survive these abuses. In these patients, periods of low blood pressure may be difficult to avoid. If hyperventilation and its accompanying low levels of carbon dioxide are added, cerebral damage may result. A syndrome that has become relatively common in recent years has been abnormal respiration at the end of an operation performed for the relief of acute intestinal obstruction in an elderly patient. This has been ascribed to residual curarization, and the cause has been sought in abnormal cholinesterase and potassium levels in the blood. To some of us, however, the condition so closely resembles cerebral damage that we have looked for simpler explanations. We have suspected periods of cerebral anoxia as the result of low blood pressure and cerebral vasoconstriction. In this field of geriatric anaesthesia, the close attention to physiological principles will improve our results.

So we see that the anaesthetist, in his development, has passed through various phases. Initially, his administrations were entirely empirical, and his observations were clouded by the wonder of the new age. Later, he observed changes in his patients under the influence of anaesthetic agents, and turned to the physiologists for explanations. Then, he found that the physiologists in many cases had already solved his problems, and he copied his methods from those employed in the laboratory. Later, the anaesthetist realized that he was adversely affecting the patient's well-being and that it was necessary to observe and record these facts. Finally he reached the time when each anaesthetic administration became an exercise in experimental physiology and pharmacology.

Today, perhaps, the pendulum has swung a little too far, and the anaesthetist is seeking complex explanations for his problems. The fact remains, however, that he is seeking the truth along the roads of physiology and pharmacology. Along these roads must lie the truth.

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HÆMOGLOBIN VALUES OF SOME NATIVE INHABITANTS OF BOUGAINVILLE, NEW GUINEA.

By HELEN COTTER,¹ J. KARIKS² AND R. J. WALSH.¹

THE hæmoglobin values of some New Guinea natives have been reported from time to time, but the results generally are difficult to compare with those obtained in other parts of the world. This is because the instruments used have not been accurately calibrated, and because the subjects of the surveys have frequently included hospital patients. Nevertheless, the results suggest that the mean values are lower for comparable age groups than those found amongst healthy white Australians (Walsh, Arnold, Lancaster, Coots and Cotter, 1953).

Recently one of the writers (J.K.) collected samples of venous blood from a large number of natives residing in Bougainville. The primary object of this collection was to determine the blood group pattern in the area, and the results of this work have been published in a separate paper (Kariks, Koopzoff and Walsh, 1957). The hæmo-

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globin value was also determined on each sample, and for this purpose the blood was mixed at the time of collection with crystals of sodium citrate; penicillin and streptomycin were also included, as described in the other paper (Kariks *et alii*, 1957), to control infection with bacteria. The results of the haemoglobin survey are reported in this paper.

Methods and Materials.

No patients in hospital were included, but samples were obtained from all available members of villages visited during patrols. The only selection was that children under two years of age were not included. At the time of blood

TABLE I.
Haemoglobin Values (Grammes per 100 Millilitres of Blood) of Adult Natives of Bougainville.

Subjects.	Number.	Mean.	Standard Deviation.
Males	691	13.09 \pm 0.073 ¹	1.92 \pm 0.052
Females	669	11.97 \pm 0.069	1.77 \pm 0.048

¹ Standard errors follow the measures to which they apply.

collection, an attempt was made to determine the age of the subject. This was not easy, and the recorded ages undoubtedly have a large error. The natives themselves were able to offer little assistance, and in most cases it was necessary to make an estimate from the general appearance of the subjects.

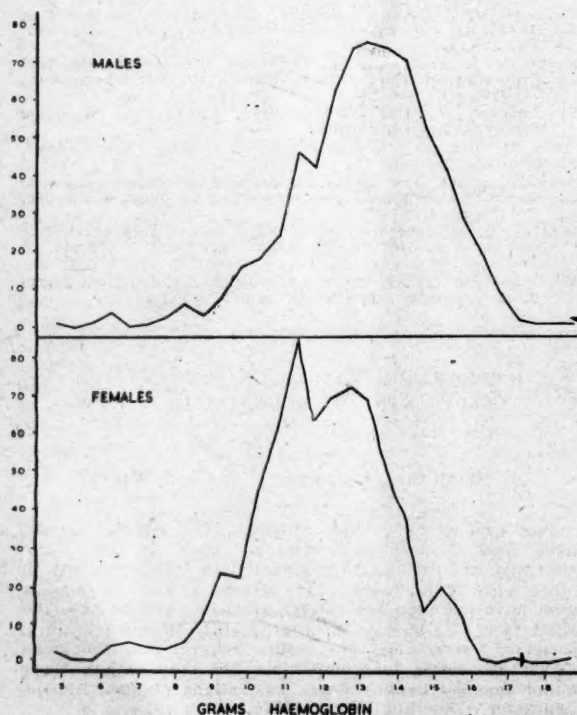


FIGURE I.
Frequency distribution of haemoglobin values as found amongst Bougainville natives.

When the samples were received in Sydney, they were rotated on a machine for about five minutes to produce uniform dispersion of the red cells. This machine is similar to that described by Dacie (1956) for mixing red cells in dilute suspension before counting. The blood was then

diluted 200 times by placing 50 cubic millimetres in 10 millilitres of 0.4% ammonia solution. The light transmission of the solution was examined in a photoelectric colorimeter, as described by Walsh *et alii* (1953). This instrument was initially calibrated in association with the National

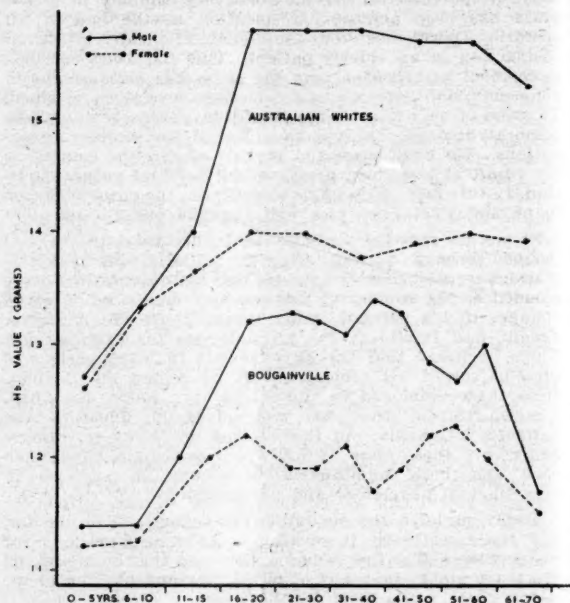


FIGURE II.
Mean haemoglobin values according to sex and age as found (i) amongst white Australians in New South Wales, and (ii) amongst natives of Bougainville.

Standards Laboratory, Commonwealth Scientific and Industrial Research Organization, to correspond with the calibration of instruments at the National Physics Laboratory, Teddington, England. Since then, it has been regularly checked with the National Standards Laboratory. The haemoglobin results are therefore equivalent to those calculated from the iron content of blood samples, and are strictly comparable with those obtained by Walsh *et alii* (1953) in their survey of white Australians and with the results of surveys by English workers using standardized instruments. The accuracy of results obtained on blood mixed with sodium citrate and antibiotics and tested several days after collection was investigated. Several specimens of blood collected in Sydney were allowed to remain at room temperature for 10 days before being tested, and the haemoglobin values did not differ significantly from those obtained on aliquots of the same samples tested immediately after collection.

Results.

A total of 1249 males and 1095 females was tested. The haemoglobin values of all adult subjects—that is, those estimated to be aged 21 years or more—were first analysed, with the results shown in Table I. The mean value of the males (13.09 grammes per centum) should be compared with a mean value of 15.71 grammes per centum found in white Australians (Walsh *et alii*, 1953). The mean value of the 669 females (11.97 grammes per centum) compares unfavourably with a corresponding value of 13.89 grammes per centum in the Australian population. Figure I shows the frequency distribution of the male and female haemoglobin values. In both sexes the curves are skew, and the range over which the values were found is large. This is reflected by standard deviations of 1.92 and 1.77, shown in Table I.

A more detailed analysis of the results, including those found in children, is shown in Table II. The mean values

TABLE II.
Haemoglobin Values (Grammes per 100 Millilitres of Blood) by Age and Sex.

Age Groups. (Years.) ¹	Males.			Females.		
	Number.	Mean.	Standard Deviation.	Number.	Mean.	Standard Deviation.
1 to 5	41	11.45±0.25 ²	1.69±0.13	49	11.22±0.21	1.44±0.15
6 to 10	180	11.37±0.18	2.42±0.13	148	11.25±0.13	1.56±0.09
11 to 15	138	12.00±0.14	1.62±0.10	98	11.98±0.14	1.38±0.10
16 to 20	159	13.23±0.13	1.67±0.09	138	12.15±0.15	1.70±0.11
21 to 25	165	13.30±0.16	2.02±0.11	147	11.94±0.15	1.86±0.11
26 to 30	108	13.18±0.17	1.81±0.12	141	11.90±0.16	1.94±0.12
31 to 35	110	13.10±0.16	1.69±0.11	109	12.12±0.17	1.80±0.12
36 to 40	53	13.39±0.26	1.91±0.17	63	11.74±0.24	1.91±0.17
41 to 45	83	13.26±0.20	1.83±0.14	45	11.93±0.24	1.62±0.17
46 to 50	44	12.85±0.33	2.21±0.24	46	12.24±0.21	1.45±0.15
51 to 55	42	12.68±0.30	1.92±0.21	32	12.28±0.20	1.62±0.20
56 to 60	59	13.00±0.22	1.66±0.15	52	11.97±0.19	1.35±0.13
66 to 70	27	11.65±0.42	2.20±0.30	34	11.51±0.29	1.69±0.21

¹ Age group 61 to 65 years: insufficient numbers.

² Standard errors follow the measures to which they apply.

shown are plotted in Figure II which also shows the mean values at different ages of the white Australian population. It can be seen that the two curves follow the same type of pattern. The mean values rise progressively throughout childhood, and at puberty a sex difference becomes apparent. In both sexes and in both surveys, there is a decline of the mean values in the later years of life. This reaches a level of significance in the case of the white Australians, but not in the case of the Bougainville native. It can also be seen from Table II that the standard deviations are never less than 1.5 grammes *per centum* and often greater than two grammes *per centum* of the mean values. The standard deviations of the female values range between 1.38 and 1.94 grammes *per centum*, indicating the large range of individual values found in every age group. The standard deviations are much higher than those found amongst the white Australians.

Discussion.

There is no evidence to support the suggestion that the low mean haemoglobin values are a physiological racial characteristic. They must, therefore, be regarded as a manifestation of tropical abnormality and as presenting a public health problem of importance. A multifactorial aetiology seems likely; but the importance of various contributing agents can be determined only by eliminating each separately and observing the response. A unique opportunity exists for such a controlled experiment, which might yield valuable information in tropical haematology. In the meantime it is interesting to speculate on the roles played by malaria, by intestinal parasites and by nutritional deficiencies.

Malaria is holoendemic in Bougainville. No attempt has been made to control mosquitoes by residual spraying or other measures, and treatment of symptomatic manifestations is inadequate except in a few areas. Usually small doses of quinine are administered by aid-post orderlies to native subjects reporting with symptoms. It is well known that malaria produces anaemia by destroying red cells, and there may also be inhibition of red cell formation by marrow depression.

Of the intestinal parasites, *Ancylostoma duodenale* (hookworm) is most likely to produce anaemia. It is generally believed that anaemia is the result of chronic blood loss from the intestinal canal in subjects with deficient intake of iron, but some workers assign a more specific action to the parasite. Hookworm is prevalent in Bougainville, and mass treatment of the population is undertaken every year or two. Reinfection undoubtedly occurs, but the problems of complete eradication are too well known to require emphasis.

There has been no recent nutrition survey of the islanders. They are essentially vegetarians, the basic diet consisting of sweet potatoes, yams, taro, tapioca, bananas,

tomatoes, beans, pumpkins, cucumbers and cabbages. Some fish is eaten by natives residing on the coastal areas, and is caught in a few of the inland rivers. However, fish does not provide a major part of the diet in any region. Pigs are reared, but, as in New Guinea, are killed only on ceremonial occasions and make a negligible contribution to the dietary animal protein, which is otherwise confined to occasional birds and opossums. It is debatable whether deficiency of dietary protein is an important factor in the development of anaemia in the Bougainville natives. Protein is required for the synthesis of both the haem and the porphyrin components of haemoglobin; but it has been demonstrated by Whipple and his colleagues (Whipple, 1942) that in deficiency states the general metabolic pool of proteins, including the plasma albumin, is reduced before there is a reduction of the haemoglobin value. In other words, the requirements of the body for haemoglobin are preferentially met before the requirements for plasma and tissue proteins.

Protein deficiency appears to be unlikely as a major cause of the low haemoglobin values in Bougainville, because of a number of unpublished observations from our laboratories in Sydney. (i) Kwashiorkor has been found in Chimbu, New Guinea, where the dietary intake of proteins is low (Venkatachalam and Ivinskis, 1957); but the mean haemoglobin values in this region are greater than those found in Bougainville. (ii) In the Wabag area of the New Guinea highlands, altitude polycythemia is marked in spite of a low protein intake. (iii) The low haemoglobin values in Bougainville are associated with high plasma protein values, especially high gamma globulin values. This is unusual when anaemia is caused by lack of protein.

No analyses have been made of the iron or other metal content of the diet of these natives. It is possible that deficiencies exist; but blood and intestinal parasites would appear to be more likely as aetiological agents and merit earlier investigation.

Summary.

A survey of haemoglobin values has been conducted amongst the native inhabitants of the island of Bougainville, New Guinea. Mean values of 13.09 and 11.97 grammes *per centum* were found for adult males and females respectively. At all ages, including infancy and childhood, the mean values are lower than those found in the Australian population, but the same age-sex pattern is found in both populations. The possible role of malaria, hookworm and nutritional deficiencies in producing the low values is briefly discussed, and the need for a controlled experiment to assess the importance of each factor is mentioned.

Acknowledgement.

The writers wish to thank Dr. John Gunther, former Director of Health, Territory of Papua and New Guinea, for his co-operation in facilitating this work.

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PREPARATION OF CHILDREN FOR TONSILLECTOMY.

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THERE has been an increasing awareness of the emotional reaction of children to the hospital experience, and numerous reports have appeared in the literature, of which the following investigations are relevant. The results of the Albany Research Project (Faust, 1952) showed that children specially prepared for any procedure gave less evidence of disturbance than the others studied. In their series only 10% of children developed changes in behaviour indicative of emotional trauma, as compared with 20% of children in the retrospective study of Levy (1945).

Booklet preparation was used by Jessner and Kaplan (1949), by Jessner *et alii* (1952) and by Prugh *et alii* (1952), but was not found to be a decisive factor in either investigation. Gusterson (1955), Eckenhoff (1953) and McDonald (1953) investigated post-operative behaviour in relation to the anaesthetic, and McClelland (1954) emphasized the importance of adequate preparation for anaesthesia.

The present investigation was designed to evaluate a booklet form of preparation by a study of the behaviour of two groups of children admitted to the Royal Children's Hospital, Melbourne, for tonsillectomy. By means of questionnaires and interviews with the mother, a measure of the child's pre-operative behaviour was found which could be compared with his behaviour studied at intervals after the operation. The children were observed in the ward and during the induction of anaesthesia.

Material and Method.

Three hypotheses were tested: that children who are prepared for tonsillectomy by means of an illustrated booklet show less disturbance than a control group (a) in the hospital ward, (b) during the induction of anaesthesia, and (c) in their post-operative behaviour.

The illustrated booklet used was similar to those prepared by Olshaker (1954), by Sever (1953), and by the Child Development Centre, Oakland, California (1951). It was entitled "Going to Hospital", and contained five line drawings of hospital scenes and four pages of text. The account included details of admission procedure, pre-operative examination and preparation, induction of and recovery from anaesthesia, and the post-operative period in hospital. With the booklet a letter was sent suggesting its method of use and recommending that the child should colour the illustrations.

The subjects were 28 boys, aged between five years and eight months and six years and ten months in June, 1955, when this study commenced. They were selected by the admission clerk and came from homes in several Melbourne suburbs; two lived in the country. A random selection technique was employed to determine which children formed the experimental group receiving the booklet.

¹ Read at a meeting of the Paediatric Society of Victoria on October 10, 1956.

The children were admitted to one ward, under the care of one sister, where they remained for 24 hours. One anaesthetist was responsible for all the children, and induction of anaesthesia was performed with sodium thiopentone.

A questionnaire covering an assessment of the child's behaviour was sent to all parents a week before the admission of their child to hospital. This provided a base line for each child from which changes in behaviour could be studied, and enabled a comparison to be made of the amount of emotional disturbance present in the two

TABLE I.
Pre-Operative Assessment.

Area of Behaviour.	Number of Children with Corresponding Rating of Disturbance.			Scores.	
	Minimal (Score, 1.)	Slight (Score, 2.)	Moderate (Score, 3.)	Experiment.	Control.
Sleep:					
Experiment	7	6	1	22	—
Control	10	2	2	—	20
Appetite:					
Experiment	10	2	2	20	—
Control	8	4	2	—	22
Dependency:					
Experiment	6	7	1	23	—
Control	8	2	4	—	24
Temperament:					
Experiment	6	5	3	25	—
Control	3	7	4	—	29
Habits:					
Experiment	6	5	3	25	—
Control	5	7	2	—	25
Fears:					
Experiment	4	7	3	27	—
Control	6	3	5	—	27
Total	..	..	..	142	147

groups. Six areas of behaviour, similar to those used in the Albany Project, were studied: sleep, appetite, dependency, temperament, fears and habits, the last-mentioned being classified as stammering, nail-biting, thumb-sucking, enuresis and "others". These areas were analysed for each child and divided into three classes of disturbance, "minimal", "slight" and "moderate", with ratings of 1, 2 and 3 respectively.

Three follow-up interviews were undertaken with each mother at one week, one month and three months after her child's admission to hospital. From these an assessment of post-operative behaviour was made. The mother rated her child's behaviour in each of the six areas as "improved", "the same" or "worse", and scores of 1, 2 and 3 were allotted respectively. The mother's ratings were relied on in each instance. The child was seen at the follow-up visits, but no direct measure was made of his behaviour or his impressions of his hospital stay.

A psychologist acting as an independent judge allotted scores to the pre-operative and post-operative behaviour of each child from the interview notes and questionnaires. These results were analysed separately.

The degree of disturbed behaviour in the ward and during the anaesthesia was scored from questionnaires completed by the ward sister and anaesthetist, neither of whom knew which children had been prepared by the booklet. The sister's report included an assessment of the child's distress on separation from his parents and after the operation, with information on any post-operative vomiting or other complications. The anaesthetist's report related to the child's cooperation and the smoothness of induction of anaesthesia. The information from these reports was analysed into "minimal", "slight" and "moderate" disturbance categories.

The group results were analysed by χ^2 and the Fisher Yates exact test to show whether the difference found could be considered statistically significant.

Results.

First, it was to be expected that some parents of the control group children would have prepared them more adequately than others. In fact, each of the 14 children in this group was considered to have been adequately prepared for hospital. Thus, in this investigation there was a booklet-prepared group and a parent-prepared group.

Secondly, no significant difference was found in the pre-operative assessment of emotional disturbance in the children of the two groups. Table I summarizes the data and indicates the areas in which most disturbance lay. Of the 28 children, it was found that 11 had bad dreams, seven stammered, four were nail-biters and three were enuretic. Twelve boys were afraid of the dark, six were afraid of doctors or nurses and 10 were fearful of needles.

TABLE II.
Assessment in Hospital.

Assessor.	Number of Children with Corresponding Rating of Disturbance.			Score.	
	Minimal. (Score, 1.)	Slight. (Score, 2.)	Moderate. (Score, 3.)	Experiment.	Control.
Ward sister:					
Experiment	12	1	1	17	—
Control	8	4	2	—	22
Anæsthetist:					
Experiment	7	5	2	23	—
Control	6	5	3	—	25
Total	..	..	..	40	47

Thirdly, the assessment of the behaviour in hospital revealed no significant difference between the two groups. Table II illustrates these results, and it is noted that three children were classified as "moderately disturbed" by the ward sister, but they were not considered to be extremely anxious or unhappy. Five children were rated as "moderately disturbed" by the anæsthetist because of heightened apprehension during the induction of anaesthesia, though none required restraint.

Fourthly, from the comparison of the post-operative behaviour of the two groups, there were definite trends indicating that the experimental group was less disturbed. For example, at one month two of the 14 children in the experimental group were assessed as "worse", as compared with seven of the 14 in the control group. Although these differences were not of statistical significance when

analysed separately, when the cumulative result of the behaviour in the ward and during the first week at home was analysed, a difference of statistical significance emerged ($P = 0.028$).

From this study the usual behaviour of a six-year-old boy after tonsillectomy can be described. When the two groups were considered together, it was found that the maximum disturbance occurred during the first week, little of this remained at one month, and at three months there appeared to be more improvement than deterioration in behaviour. Every child showed some degree of emotional reaction after the operation.

The results of the inquiry into the six areas of behaviour in the 28 children studied are summarized in Table III, and are described briefly as follows:

Sleep.

Twenty-two children showed disturbance in their sleep pattern during the first week, which persisted in four children after one month and in one child after three months.

Appetite.

As was to be expected, nearly all the children were reported to have poor appetites during the first week, but after one month 11 had better appetites than before their admission to hospital.

Dependency.

Twelve children showed increased dependency during the first week.

Temperament.

Half the children displayed undesirable changes in temperament, which were mainly transient.

Habits.

The results in the habit area were more variable, but on the whole showed improvement.

Fears.

Five children were said to have an increased fear of "needles" after the hospital experience.

Discussion.

This investigation illustrates the difficulties which are met with in this type of research. The initial problem was to obtain sufficient subjects in the age range. Next, it was impossible to ensure that every child received the same treatment: two children required an additional 24 hours in hospital, two had anaesthesia induced with ethyl

TABLE III.
Post-Operative Assessment.

Area of Behaviour.	Number of Children in Each Group with Corresponding Assessment of Behaviour.								
	One Week.			One Month.			Three Months. ¹		
	Improved.	Same.	Worse.	Improved.	Same.	Worse.	Improved.	Same.	Worse.
Sleep:									
Experiment	0	4	10	0	13	1	3	9	1
Control	0	2	12	0	11	3	2	11	0
Appetite:									
Experiment	0	3	11	6	8	0	6	7	0
Control	0	1	13	5	8	1	5	8	0
Dependency:									
Experiment	0	8	6	0	12	2	0	12	1
Control	0	8	6	0	12	2	0	12	1
Temperament:									
Experiment	0	8	6	2	12	0	5	8	0
Control	0	6	8	1	9	4	3	9	1
Habits:									
Experiment	4	7	3	5	8	1	3	9	1
Control	4	8	2	3	9	2	7	6	1
Fears:									
Experiment	0	11	3	0	12	2	0	11	3
Control	0	12	2	0	11	2	0	10	3

¹ The results for one child in each group are omitted from the three-month follow-up, because of insufficiency of data.

chloride owing to failure in venepuncture, and another two required penicillin post-operatively. Other uncontrollable variables affecting the treatment and reaction of each child were the different sizes of the tonsils, the amount of hemorrhage and the innumerable events, such as intervening sickness and starting school, which occurred during the three-month follow-up investigation.

Further, it is to be expected that the nursing care both at home and at hospital would differ, as the attitudes of the personnel caring for the child differ. Any one child's experience in hospital is an entirely individual event, differing from that of any other child. The investigator observed one child's fearful reaction to an open tray of post-operative instruments, and another's distress following a ward maid's thoughtless remarks.

The difficulty of obtaining reliable information is well known. As the socio-economic and educational backgrounds of the mothers differed, so did their reports vary in detail and accuracy, and their attitude to the study was reflected in their willingness to keep follow-up appointments. A number of home visits was necessary in order to complete the data.

The greatest difficulty, as in all such studies, was encountered in ascribing numerical quantities to emotional factors, and in establishing a base line for each child from which to assess variations in behaviour.

In order to reduce the bias of the investigator, reliance was placed on the mothers' ratings, structured interview guides, questionnaires and scoring criteria being used. An experienced psychologist, unaware of the grouping of the children, rated certain areas of behaviour, and his results were essentially the same as those of the investigator.

The unexpected finding that all the 14 children of the control group had been adequately prepared by their parents was probably an atypical result. One parent interviewed, whose child was excluded from the sample on medical grounds, informed the investigator that "it was bad enough to have to come into hospital anyway, without scaring them beforehand".

From the results of this study several improvements in the booklet could be made. It had been my belief that unpleasant as well as pleasant incidents should be included, so that a child knew that he would get a "prick in the arm" and that this might "hurt a little bit". In view of the finding that 10 of the children were afraid of "needles" beforehand, this reference to injections could well be omitted. Liddell (1954) observed that sheep and goats became very disturbed if they had been prepared for a painful stimulus that was later withheld, and this might suggest that the experimental group, forewarned of the two injections, were disturbed when these did not hurt as expected.

All the mothers who received the booklet expressed their enthusiastic approval of its use, and reported that their children enjoyed colouring the illustrations.

Conclusions.

This study has served to illustrate the problems that are encountered in any attempt to investigate emotional behaviour and to assess changes in this over a period of time. It will be appreciated that many aspects covered in this investigation have been omitted from this paper, which has given the group results rather than the individual case histories. Only a full study of the latter can complete the picture.

When it is considered that the sample of subjects was drawn from the general population, the amount of emotional disturbance found in the pre-operative assessment is appreciable. In three instances psychiatric treatment was recommended.

The results showed throughout a consistent trend, in that the prepared group of children exhibited less disturbance than the control group. However, as no overall statistically significant difference was found between the

two groups, it cannot be claimed that the booklet used greatly reduced emotional disturbance after tonsillectomy.

It must be remembered that this investigation has not assessed the effects of preparation *per se*, but has compared a booklet preparation with a verbal preparation by parents. It is now almost universally agreed that some form of preparation should be given to the child. The investigator entirely concurs with the advice given by the paediatric surgeon Willis Potts (1956):

Tell them in simple words why they have to go to the doctor or the hospital or why they have to have an operation and, in most instances, they will cooperate in a fashion that adults might well emulate. Faith and trust are completely unspoiled when children are dealt with honestly. So little effort; so great the reward.

Summary.

1. The effectiveness of a booklet form of preparation in reducing emotional disturbance following tonsillectomy was investigated by analysing the behaviour of 28 boys, 14 of whom received the booklet.

2. The behaviour of each child was assessed prior to his admission to hospital, in hospital, and for a period of three months after his discharge.

3. The booklet seemed to have some effect, but the results were not statistically significant.

4. Every child experienced some emotional reaction, which was mainly centred around changes in the sleep pattern, appetite, dependency and temperament. These were at their maximum at one week, were considerably less at one month, and had usually disappeared three months after operation.

Acknowledgements.

I wish to thank Dr. V. L. Collins, the Medical Director, for his helpful advice and for his permission to carry out this study on patients at the Royal Children's Hospital, Melbourne. The resident medical, nursing and clerical staff gave me every assistance. I acknowledge the help given by Professor O. A. Oeser and the staff of the Psychology Department, University of Melbourne. I also thank Mr. J. G. Lyle, who scored the interview records, and Mr. L. P. Crutcher, who illustrated the booklet.

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STAFF PROTECTION IN AN AUSTRALIAN DIAGNOSTIC X-RAY DEPARTMENT.

By MORRIS OWEN,

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WITHIN months of the original description of X rays accounts were given of ill-effects to workers who were in contact with radiation. Since that time there has been a growing awareness of the need to protect personnel who work in the proximity of X-ray equipment. Of recent years there has been intensified study of this problem.

Whilst the International Recommendations permit occupationally exposed personnel a total body radiation dose of 0.3r per week, the recommendations are careful to add that every effort must be made to reduce the dose to as little as possible.

TABLE I.

Film-badge Records Analysed According to Personnel Grouping; Summarized from Osborn (1955).

Authority.	Doses in r per Week.		
	Radiologists.	Technicians.	Nurses, Assistants.
Literature quoted by Osborn.	0.001 to <0.3	0.001 to <0.3	<0.05 to 4.5
Osborn (weekly readings for 13 weeks).	Average, 0.035	0.068	—
	Maximum in one week, 0.19	0.70	—

Various authors have reported the results of radiation monitoring in diagnostic X-ray departments. Thus, Morgan (1955) charted the isodose curves in the region of an operating fluoroscope, indicating the zones of greatest hazard of secondary radiation. Osborn (1955) examined the literature and tabulated the doses received by personnel in several departments. These doses were assessed from film-badges worn by the various members of the staff. The exposures ranged between 0.001r and 4.5r per week. Osborn added the measurements of film badge exposures of his staff over a 13 weeks' survey (Table I). No record

of film-badge radiation measurement has been located for personnel working in departments in this country.

A study is here reported of film-badge readings in a diagnostic X-ray department in an Australian hospital. Monitoring films were carried by all members of the staff with the exception of clerical personnel. The location of the clerical working area is away from regions which could be regarded as subject to abnormal radiation. The film-badges were worn on the chest or at waist level, during working hours throughout the year. The films were renewed each month. The recorded figure is the average exposure for one week. Physical measurements were made by the State Bureau of Physical Services. Films whose density did not vary significantly from that of the control film are recorded as having "negligible" exposure, and had received radiation not exceeding two milliröntgens per week.

During the year July, 1956, to June, 1957, the doses recorded ranged from "negligible" to 50 milliröntgens (Table II). The recorded radiation for some personnel was "negligible" on all occasions. For several months the exposures were reported as "negligible" for all personnel.

Staff have been grouped as radiologists, radiographers and trainee-radiographers, and general duties. The work in the department averages 3300 examinations per month. The proportions of the different types of examination are shown in Table III. "Skeletal" examinations include the nasal sinuses, skull and spine, as well as the extremities. "Abdomen" includes pregnancy examinations, but not pyelograms. There were few major contrast examinations (such as salpingography); such examinations are included under "miscellaneous". Contrast examinations of heart or brain and pelvimetric examinations were not performed.

In an analysis of the exposures reported, readings other than "negligible" occasioned study to find the risks which caused them, and to formulate methods of avoiding the radiation. Whilst it is impossible in most cases to be certain of the instance or instances which resulted in the dose recorded, several factors were incriminated. These included standing close to the patient during dental and mobile unit ("portable") examinations, accidental exposure of personnel entering a room during radiography of a patient, and in some cases the wearing of a film-badge during personal medical X-ray examinations (diagnostic examination of teeth or chest).

Whilst it is obvious that personnel receive some radiation, although frequently so little as not to be measurable with film-badges, the record of the past several months is regarded as satisfactory by present-day standards.

TABLE II.

Film-badge Readings (July, 1956-June, 1957) of Staff (Royal Newcastle Hospital) Grouped According to Duties.

Subject.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Radiologists:												
Subject 1 ..	N	N	N	N	N	N	N	N	N	N	N	N
Subject 2 ..	25	Resigned	N	N	N	N	N	N	N	N	N	N
Subject 3 ..	Joined staff August	N	N	N	N	N	N	N	N	N	N	N
Radiographers or trainees:												
Subject 1 ..	—	N	N	N	N	N	N	N	N	N	N	N
Subject 2 ..	N	N	N	N	N	N	N	N	N	N	N	N
Subject 3 ..	N	25	N	N	N	N	N	N	N	N	N	N
Subject 4 ..	50	N	N	N	N	N	N	N	N	N	N	13
Subject 5 ..	25	25	10	N	N	N	N	N	N	N	25	13
Subject 6 ..	25	25	N	N	N	N	N	N	N	N	N	13
General duties:												
Subject 1 ..	N	50	N	Resigned	—	—	—	—	—	—	—	—
Subject 2 ..	N	N	N	N	N	N	N	N	N	N	N	N
Subject 3 ..	N	N	N	N	N	N	N	N	N	N	N	N
Subject 4 ..	N	N	N	N	N	N	N	N	N	N	N	N
Subject 5 ..	N	N	N	N	N	N	N	N	N	Resigned	N	N
Subject 6 ..	N	N	N	N	N	N	N	N	N	Joined staff April	N	N
Subject 7 ..	N	N	N	N	N	N	N	N	N	N	N	N

¹ Films were worn for one month; the figure given is the average weekly dose in milliröntgens. "N" indicates negligible reading. A dash indicates no film submitted.

² Duties of Radiographer 5 comprise one-fifth diagnostic radiography and four-fifths superficial therapy radiography.

Occasional "spot" checks have been made with a "Victoreen" minometer worn in places other than the chest or waist—for example, the wrist, ankle or shoulder. These readings have not indicated a hazard.

It has been considered worth describing the protection features involved. They are the use of distance, lead (or equivalent) screening, and the avoidance of direct radiation. Personnel are not permitted to hold patients or (with the exception of mobile X-ray work) to be away from protection screens during radiography. During fluoroscopic examinations, staff other than the radiologist

TABLE III.

Analysis of Examinations (Year 1956-1957) According to Their Proportion of the Total Work Load. The Average Number of Examinations per Month was 3360.

Type of Examination.	Percentage of Total.
Abdomen	2.0
Barium sulphate studies—meals, enemas	6.0
Chest (other than fluorographic)	47.7
Chest (fluorographic)	5.7
Dental	3.0
Gall-bladder	1.8
Miscellaneous	0.7
Pyelography	2.5
Skeleton	30.5

and students remain behind lead-screen protection. The radiologist and students remain behind the protection afforded by the screen-spot-film device and its lead apron. The radiologist wears a lead rubber apron and his examining hand is gloved (lead rubber). All X-ray tubes have a minimum of two millimetres added aluminium filtration.

During the past several years, designs for new room layouts and protection screens have been submitted to the State Bureau of Physical Services for approval. In no case has the design or construction of protection posed an insuperable difficulty.

Summary.

A report is presented of the radiation received by the staff of an X-ray department of a general hospital. The nature and quantity of the diagnostic work performed have been indicated, and the features of the protection against radiation have been described.

It is apparent that employment of the generally advised means of protection confers a reasonable degree of freedom from radiation exposure.

Acknowledgements.

Thanks are due to the State Bureau of Physical Services for all the physical measurements, and to Mr. B. W. Scott, Director of the Bureau, for his advice in the past several years, on matters concerning radiation protection.

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MELANESIAN NATIVES AND VASCULAR DISEASE: A NOTE BASED ON AUTOPSY RECORDS, 1923-1934.

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THE present intensified interest in the causation of vascular degeneration has led the writer to examine some existing records of autopsies on Melanesian natives for evidence of the occurrence of vascular disease in these people.

The post-mortem notes used for this purpose relate to 724 autopsies on adult natives carried out by the writer or his predecessor and mentor, Dr. G. A. M. Heydon, during the

period 1923 to 1934. The records of a further 583 autopsies performed in subsequent years up to June, 1940, were lost, but their inclusion would not have greatly affected the pattern of incidence shown in the present analysis.

Relative to cardio-vascular disease it was the practice to examine the heart, the arch of the aorta, the orifices and proximal portions of the coronary arteries and variable lengths of the thoracic aorta. The abdominal aorta and the peripheral arteries were not examined as a routine. This omission is, of course, a regrettable one from the point of view of the incidence of atheroma; but at the time the interest was focused more on the possibility of finding evidence of vascular lesions associated with yaws than on the general problem of arterial degeneration.

A clinical study of cardio-vascular disease was made by Levine (1946) on 200 natives of the villages of Uritai and Seapiapi in Papua. He records that "some degree of thickening and tortuosity of the brachial, radial, temporal and dorsalis pedis arteries was noted in 29 individuals". This observer goes on to state that "none of the 56 individuals of 26 years or older showed retinal vascular changes".

The recorded ages of Melanesian natives are usually rough approximations, arrived at after a combined process of inspection, calculation based on questions relative to time-fixing incidents and more or less intelligent guesswork. Although the age was not shown in all the records under review, an indication of the age distribution is given in Table I, which covers 630 adult male natives whose ages had been taken from the hospital card or contract of service.

TABLE I.

Age Groups of 630 Male Natives of Whom the Age was Recorded.

Age Group. (Years.)	Number of Subjects.
15 to 20	78
21 to 30	432
31 to 40	95
41 to 50	21
51 to 60	4

This merely emphasizes the fact that most of those admitted to hospital at that time were young adults from the indentured labour force. Of the 724 records examined for the present purpose, 674 were of males and 50 of females. Evidence of some abnormal appearance, usually of a minor character, in the arch of the aorta was noted in 97, including 10 of the 50 females. Some typical entries are: "Aorta shows a few small patches of early atheroma near valve cusps". "Coronary arteries normal." "Aorta shows a few small patches resembling early atheroma near valve." "Some fatty tablelands present in aorta round coronary orifices, which were not narrowed by them." These lesions were of the nature of small subintimal deposits of fat, usually in the form of round, slightly raised papules, but sometimes appearing as linear ridges. Closely set wrinkles were not uncommon. Since all but about a dozen of the entries refer to this early type of degeneration, they will not be given in detail here. Examples of more severe damage are given in Table II. Even amongst these cases only three (132, 30/56 and 30/70 in the table) could be described as advanced. There is some doubt, in view of the microscopic findings, whether these were primarily degenerative.

Discussion.

These findings, derived as they are chiefly from the younger age groups, may give a misleading impression of the overall incidence of arterial disease; but the indications are that it is low. In the few advanced cases of aortic disease detailed in Table II, the microscopic appearances, with their round-cell foci and capillary proliferation involving the middle coat, suggest rather a chronic inflammatory than a primary degenerative change, although this latter cannot be excluded. At the time when these observations were made, syphilis was unknown to these natives, and as far as the writer is aware, it still is. It should be

TABLE II.

Summary of Findings at 12 Autopsies, in which were Present Aortic Lesions of More Advanced Type than Those More Commonly Seen.

Reference Number.	Sex of Subject.	Age. (Years.)	Cause of Death.	Vascular Lesion as Described in Autopsy Notes.	Remarks.
H/162	M.	35 to 40	Tropical ulcer, toxæmia.	"Just distal to aortic valve half-crown sized patch of atheroma, raised but not obviously calcareous. In two places close together in this patch the wall is slightly thinned with two 'balloonings'."	—
161	M.	23	Tropical ulcer, toxæmia.	"Aorta shows few small raised yellow granules in aortic arch near coronary orifices. The proximal portions of the coronary arteries show similar patches but flatter and more diffuse."	Liver, weight 56 ounces, shows early diffuse cirrhosis presenting a "morocco leather" surface and rough granular section.
193	M.	28	Tropical ulcer, toxæmia.	"Aorta: Small raised patch near right coronary. Coronary arteries are dilated and show some small raised opaque areas in proximal parts."	—
33/16	M.	30	—	"Aorta: A few atheromatous patches above aortic valve. Coronary orifices appear small. Left coronary shows distinct thickening with narrowing of lumen some distance from orifice."	Kidneys: right, 3.0 ounces, cortex narrow; left, 5.0 ounces, dark irregular cortex with much scarring.
50	M.	48	Bronchopneumonia.	"Aorta: Small patch resembling atheroma just above valve. Some closely set wrinkles present. Coronary arteries normal."	Liver: 39.5 ounces, engorged "nutmeg" type.
132	M.	48	"Jaundice" cause not determined.	"Aorta: Well marked atheromatous degeneration of arch and to less degree of descending thoracic aorta. Valve cusps normal. Coronaries dilated. No degeneration of coat in proximal portions examined."	Liver: 89 ounces; pale yellow with greyish translucent streaks of fibrous tissue. Very firm on pressure.
143	M.	35	Chronic osteitis.	"Aorta: Atheromatous wrinkling near valve of orifices of coronary arteries which however are patent and appear normal in proximal portions."	Liver: 23 ounces; tough consistency.
30/56	M.	32	Multiple abscesses in muscles; toxæmia.	"Aorta: Arch shows many raised yellowish plaques, also pits and wrinkles. There is no smooth normal intima in whole arch. Process confined to arch and not seen in thoracic aorta beyond."	Microscopic section: shows absence of normal intima, thickening of subintimal layer with some round and ovoid cells present. In middle and outer coats are focal collections of small round cells and the <i>vasa vasorum</i> advance into middle coat. Occasional calcareous deposit. Liver: Early cirrhosis and fatty change.
30/70	M.	50	Gangrenous stomatitis, toxæmia.	"Aorta: Arch greatly dilated and shows extreme degree of degeneration, with large calcareous plaques. Process commences a little distance above aortic valve cusps, which are normal, and extends as far as middle of descending thoracic aorta but is most marked about roots of great vessels. The coronaries are patent."	Microscopic section: Shows round-celled foci about <i>vasa vasorum</i> , and these invade towards intima, which has lifted and disappeared. Middle coat shows scarring and irregular wrinkling of laminae. No calcareous deposits in sections studied. Kidneys: Arteriosclerotic, showing depressed atrophic patches in cortex.
32/01	M.	50	—	"Aorta: Marked wrinkling of aortic arch and thickening with narrowing of lumen of right coronary artery."	Kidneys: arteriosclerotic, irregularly granular with retention of cysts in cortex.
H/185	F.	30	Sepsis, general peritonitis.	"Aorta: A number of small fatty elevations about origin of aorta and the orifice of one coronary artery is narrowed by them."	—
H/195	F.	38	Pneumonia.	"Aorta: Fat areas at root of aorta and some calcification in one patch."	Extensive scars of old-standing ulcers about right ankle. Liver: 83 ounces, not fibrotic.

noted, however, that Dr. G. A. M. Heydon in 1922 saw a native with penile lesions which he considered possible chancres, but which showed little induration. Spirochaetes which could have been either *Treponema pallidum* or *Treponema pertenue* were demonstrated by dark-ground illumination. The writer, during about 20 years in New Guinea, neither saw nor heard of a frankly syphilitic lesion (as seen in venereal syphilis of Europeans) in a full-blooded Melanesian native. The question of the existence of syphilis in the Trobriand Islands and in the Papuan peoples generally has been discussed by Black (1957) in commenting on the reports of Bellamy and others. This freedom from syphilis is ascribed to an immunity conferred by the widespread prevalence of yaws. Yaws is generally considered not to cause visceral, vascular or nervous lesions, although Chaisser (1929), writing in Haiti where both diseases are said to occur, produced some rather unconvincing evidence in support of the contrary view.

Acknowledgements.

The writer wishes to thank Dr. G. A. M. Heydon for the use of his autopsy records, and Dr. B. R. V. Forbes and Dr. R. H. Black for helpful criticism and suggestions.

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Reports of Cases.

BOWEL OBSTRUCTION DUE TO MECKEL'S DIVERTICULUM.

By J. S. LEKIAS,
Perth.

THE occurrence of three cases of intestinal obstruction due to Meckel's diverticulum within four months in one hospital must be an uncommon event. As this happened between August 17 and December 17, 1955, at the Royal

Perth Hospital, it is considered worthy of report. Another case occurring one year later is also reported.

Case I.

A man, aged 32 years, was admitted to hospital on August 17, 1955, complaining that for three years he had suffered from recurrent attacks of dull abdominal pain, which occasionally caused him nausea and vomiting. On the day of his admission the pain had begun as usual, but increased in intensity. On examination, the patient was a rather obese, fit young man in no obvious discomfort; his temperature was 99°F., his pulse rate was 118 per minute, his tongue was furred and his breath was abdominal. The only positive finding on examination of the abdomen was tenderness in the right iliac fossa with hyperaesthesia over the same area. Rectal examination revealed slight tenderness on the right side. Appendicectomy was then undertaken by the resident medical staff, a provisional diagnosis

period, he was transferred to a surgical ward because of the continuance of pain, which was now located in the right iliac fossa. Through an interpreter it was learnt that he had undergone an appendicectomy several years before. His temperature was now 100°F., his pulse rate was 104 per minute, his tongue was furred and his breath was foul. He now had generalized rigidity and guarding, with marked tenderness in the right iliac fossa. The abdomen was silent. A plain X-ray film of the abdomen showed dilated loops of small bowel with multiple fluid levels. Therefore a diagnosis of peritonitis due to bowel obstruction was made, and operation was offered to the patient. He refused surgery for twenty-four hours, and when he finally submitted to laparotomy (Mr. G. S. Pestell), foul-smelling free fluid and black gangrenous loops presented into the wound. This finding was due to a volvulus whose apex was a Meckel's diverticulum. The volvulus was resected and an end-to-end anastomosis was performed, the abdomen being closed without drainage. He made an uneventful recovery.



FIGURE 1A.

Large Meckel's diverticulum (Case I).

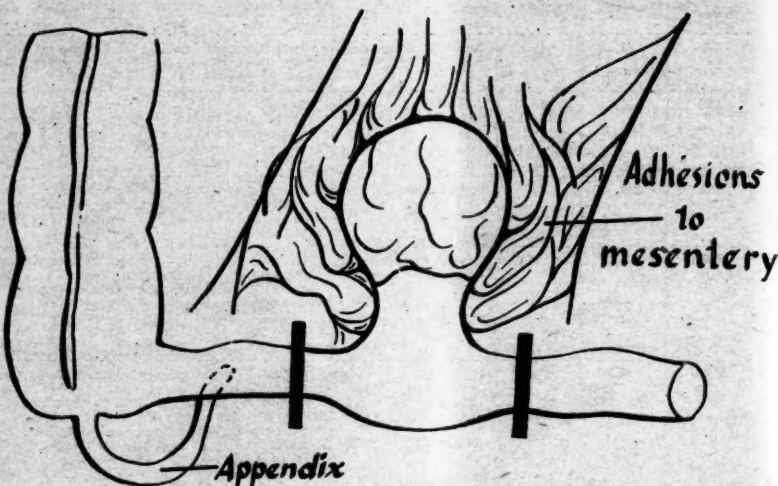


FIGURE 1B.

Case I: Large Meckel's diverticulum causing subacute obstruction by fixation of its apex to the root of the ileal mesentery by adhesions.

of recurring subacute appendicitis having been made. Through a muscle-splitting McBurney's incision it was found impossible to identify the appendix, because a large dilated loop of ileum persistently presented into the wound. On reviewing the situation, a surgeon of the visiting staff (J.S.L.) was unable to reach a diagnosis. Therefore a right paramedian incision was made, which disclosed that the presenting loop in fact was the base of a Meckel's diverticulum, measuring some six inches in length and four inches at its widest diameter, and attached by broad adhesions to the base of the mesentery and by lateral bands to the ileum and mesentery on either side. Further exploration of the caecum revealed an acutely inflamed appendix situated in a retro-ileal position. Both the appendix and the Meckel's diverticulum, with about four inches of small gut on either side, were resected and an end-to-end anastomosis was performed, the abdomen being closed without drainage. Post-operative convalescence was uneventful.

Case II.

A male patient, aged 45 years, was admitted to hospital on August 19, 1955, complaining of abdominal pain, diarrhea and vomiting, following a meal of fish. On examination of the patient, his temperature was 98°F. and his pulse rate 74 per minute. The pain in the abdomen caused him to roll about, but there was no guarding of the abdominal muscles although he was rigid with the spasms of pain. After being watched in the observation ward and treated with non-absorbable sulphonamides for a

Case III.

A woman, aged 45 years, was admitted to hospital on December 17, 1955, complaining of severe abdominal pain of two days' duration, which had gradually increased, was colicky in type and was now constant. There was no vomiting, although she was nauseated, and for two days she had had complete anorexia and absolute constipation. This constipation had been increasing over the previous few weeks. On examination, the patient was a thin, pale woman in obvious pain; her temperature was 99°F., her pulse rate was 72 per minute, her tongue was coated and her breath was abdominal. The abdomen moved only in its upper half with respiration; the lower half was rigid, and a tender mass was palpable in it. Vaginal examination gave the impression that this was cystic and situated in the anterior fornix. On rectal examination, faeces were present in the rectum. A provisional diagnosis of acute bowel obstruction or twisted ovarian cyst was made and laparotomy was undertaken (Mr. A. R. Robinson). When the abdomen was opened, pink fluid with gangrenous bowel presented into the wound. A Meckel's diverticulum was found passing to the root of the mesentery, and under this a loop of ileum had herniated and twisted upon itself. The Meckel's diverticulum and the volvulus were resected and an end-to-end anastomosis was performed. The post-operative period was rather protracted, requiring prolonged intravenous hydration and aspiration. This was thought to be due to edema at the site of anastomosis. She subsequently developed a mass in the right side of the abdomen, thought to be omental fixation around the suture line.

After her discharge from hospital she was found to have a duodenal ulcer. Troublesome diarrhoea, which started in hospital, has continued, though to a far less degree. She has gained in weight and is otherwise quite well.

Case IV.

In January, 1957, a further patient was operated upon. A boy, aged 13 years, was admitted to the Royal Perth Hos-

pre-operative diagnosis was made of small-bowel obstruction, possibly due to internal herniation, with a Meckel's diverticulum, and after resuscitation laparotomy was performed. "Gangrenous" bowel presented into the wound, and this was found to be caused by a Meckel's diverticulum behaving almost exactly as in Case III. However, because the bowel showed signs of viability after the band had been divided, and because the anaesthetist was concerned



FIGURE IIA.

Case II: Showing fibrous band from diverticular apex and a pure volvulus.

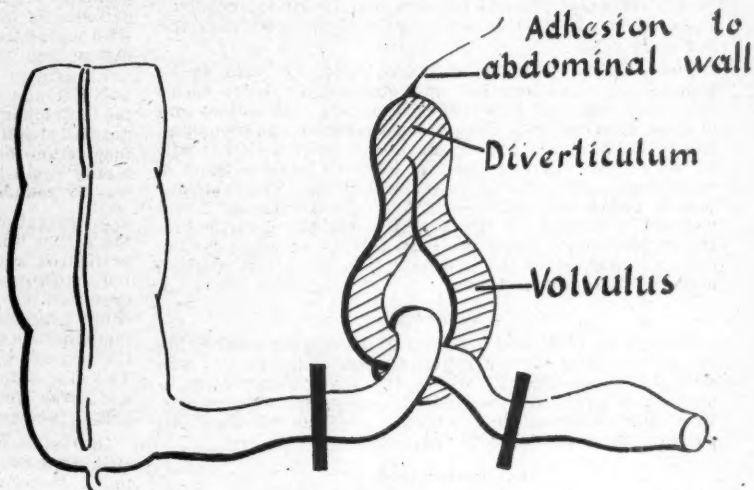


FIGURE IIB.

Case II: Resected bowel, gangrenous as the result of fixation of fibrous cord, which acted as a centre of rotation for the strangulated loop of bowel.

pital with a history of vomiting of three or four days' duration, absolute constipation and severe abdominal pain. The parents considered him to be suffering from food poisoning and did not seek medical advice until the day of his

by the condition of the patient, resection of the diverticulum only was undertaken. The boy made a slow but steady recovery, and one month after operation was in normal health.



FIGURE IIIA.

Case III: Gangrenous loop of bowel.

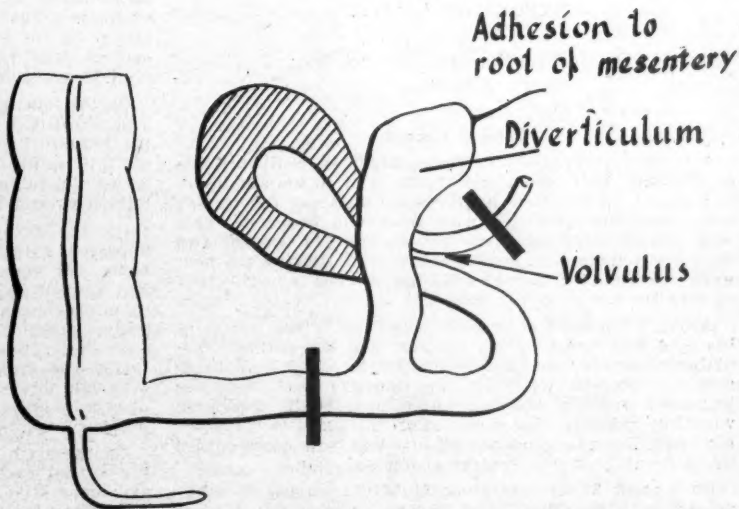


FIGURE IIIB.

Case III: The resected specimen of bowel, gangrenous as the result of fixation of the fibrous cord to the root of the mesentery, under which a loop of ileum had passed and become strangulated.

admission to hospital, when he was found to have a distended abdomen and to be grossly dehydrated. A plain X-ray film of the abdomen revealed dilated small bowel, particularly in the right iliac fossa, with fluid levels. A

Discussion.

There is a large literature concerning Meckel's diverticula, and from various authors it would appear that certain criteria are necessary for the abnormality to be

recorded as true Meckel's diverticulum. These are, that the diverticulum should be at the ante-mesenteric border of the ileum, proximal to the ileo-caecal valve, with a separate blood supply and having all layers of the small bowel. It has been aptly called "the disease of two's"—that is, it occurs in 2% of the population two feet from the ileo-caecal valve, and causes symptoms requiring operation in 2% of cases; the incidence is said to be in the ratio of two to one, males to females, and under the age of 30 years in 90% of cases. It will be seen that in all the reported cases except one in this paper the patients were over the age of 30 years.

The common methods of presentation are said to be haemorrhage, inflammation and obstruction; large series have been reported in which 60% caused obstruction, and of these a further 60% caused obstruction by adhesions and less than 5% by a volvulus. From this brief review it will be seen that volvulus from a Meckel's diverticulum is uncommon—this occurred in the second case. The first case was of added interest, since not only was subacute bowel obstruction caused by the adherence of the diverticulum to the mesentery, but in addition to this an acute inflammatory condition of the appendix in a retro-ileal position occurred at the same time.

Summary.

Four cases of Meckel's diverticulum causing obstruction are presented, in three of which the age of the patient was over 30 years, and in which the diverticulum plus a segment of bowel was resected with end-to-end anastomosis. In a fourth case the diverticulum alone was removed. All patients made good recoveries.

Acknowledgements.

I am indebted to Mr. L. E. Le Souef and Mr. B. Nairn, in whose beds these patients were treated, for permission to use their material; to Mr. A. R. Robinson and Mr. G. S. Pestell for information regarding Cases III and II respectively, in which they performed the operations; and also to Mr. Van Ralte for the photographic reproduction of the specimens.

EXCHANGE TRANSFUSION IN HEPATIC COMA: REPORT OF A CASE.

By CHARLES LEE AND ARNOLD TINK,
Sydney.

Clinical Record.

A MALE PATIENT, aged 13 years, had been well until the end of July, 1957, about one month prior to his admission to hospital. At this time he developed an upper respiratory tract infection associated with fever and headache. This was diagnosed as influenza. He was put to bed for two days and remained at home for one week. During the next week he attended school and had a good appetite, but seemed tired.

About the middle of August, yellowing of the whites of his eyes was noted by his parents, and the patient complained that his urine had become dark. Apart from tiredness he seemed well. He was put to bed. Jaundice increased rapidly and was associated with occasional vomiting episodes. One week after the onset of jaundice his condition was much worse, and was now accompanied by moderately severe central abdominal pain.

On August 27 he was given 50 milligrammes of chlorpromazine hydrochloride, which was vomited. A further dose of 50 milligrammes was given, and this was retained. On the same day he seemed to become drowsy. Over the next three days he became worse, with intermittent periods of drowsiness and restlessness. Shaking and flapping his hands with jerking movements of the upper limbs had been noticed by his parents.

He was first examined by us on August 31, when he was admitted to hospital. No history of contact with or inges-

tion of toxic substances could be obtained. The possibility of contact with rat excreta could not be excluded, as there was a rubbish dump near by.

On examination of the patient he was deeply jaundiced. From time to time his vomitus contained moderate amounts of bright and altered blood. He was frequently drowsy, responded slowly but intelligently to questions, and at other times appeared rather apprehensive. His pupils were dilated. There were slight, intermittent episodes of muscle spasm in the upper limbs associated with adduction of the arms, extension of the forearms and flexion and pronation of the wrists. His lips and gums were swollen and red. A grade II systolic murmur was heard in the third left intercostal space and conducted to the pulmonary area. The pulmonary second sound was normally split. The liver edge was palpable on deep inspiration, felt thin and was not tender. No other abnormality could be detected in any other system. His weight was 99 pounds.

Investigations at this stage gave the following results: the serum bilirubin content was 18 milligrammes per 100 millilitres, and the blood urea content 37 milligrammes per 100 millilitres, and the haemoglobin value was 15.9 grammes per centum. The leucocytes numbered 8500 per cubic millimetre, of which neutrophils numbered 7565 and lymphocytes 680. The thymol turbidity was six units, and the thymol flocculation test produced a negative result. The zinc sulphate turbidity was 10 units. Both bile salts and large amounts of bile pigment were present in the urine. Increased urinary urobilinogen was not detected.

On the second day he was restless and disorientated, but still responded to commands. The jaundice had become much deeper, and towards evening he was semi-comatose. The serum bilirubin content had risen to 32 milligrammes per 100 millilitres. On the third day he was unconscious and responded to painful stimuli only. He had marked jaw stiffness and some spine stiffness. Flapping movements of the hands continued. The liver edge could not now be felt. The serum bilirubin content was 35.6 milligrammes per 100 millilitres.

At this stage deepening jaundice and increasing coma and muscle tone indicated rapid deterioration, and it was our impression that the illness was progressing to a fatal termination. During the afternoon of the third day an exchange transfusion of 3260 millilitres of fresh blood was given. At the end of this procedure his serum bilirubin content was 17.4 milligrammes per millilitre and his clinical condition remained unchanged.

On the fourth day he was comatose and deeply jaundiced. The serum bilirubin content had risen to 24 milligrammes per 100 millilitres. At 3 p.m. a second exchange transfusion of 3140 millilitres was given. After this procedure his serum bilirubin content was 9.9 milligrammes per 100 millilitres and his clinical condition remained unchanged.

On the fifth day coma persisted, but the jaundice appeared a little less. There were no focal neurological signs, but generalized muscle stiffness was still present. The area of liver dullness appeared smaller to percussion than previously. The serum bilirubin content was 16.8 milligrammes per 100 millilitres. At 5 p.m.—that is, 24 hours after the conclusion of the second exchange transfusion—he responded intelligently to the spoken word, although slowly. His vision was poor. He was unable to discriminate or fix with his eyes. When left alone, he became stuporose again.

On the sixth day, and 36 hours after the completion of the second exchange transfusion, he was fully conscious and cooperative. His speech was normal. "Can I have fish and chips for breakfast?" "I feel very hungry." His vision was normal, and his serum bilirubin content was 15 milligrammes per 100 millilitres.

Convalescence continued uneventfully, and the serum bilirubin content gradually fell to normal values. Eleven days after his admission to hospital the liver edge was palpable on deep inspiration. It felt thin, was not tender, and although appearing small, was of normal consistency. He was discharged from hospital 37 days after admission.

The patient was reviewed seven weeks after his admission to hospital. He seemed well and was free of jaundice and his liver appeared normal to palpation. At this stage the serum bilirubin content was 0.8 milligramme per 100 millilitres, the thymol turbidity was four units, the result of the thymol flocculation test was negative, the zinc sulphate turbidity was 10 units, and the serum alkaline phosphatase content was 33 King-Armstrong units per 100 millilitres.

On the third day polythene tubing was inserted into the inferior vena cava via the right femoral vein. This tubing served for the exchange transfusions and for the continued intravenous administration of fluids. The tube remained in place for seven days.

Investigations.

The results of liver function tests and blood urea estimations are indicated in Figure 1. Urobilinogen was absent

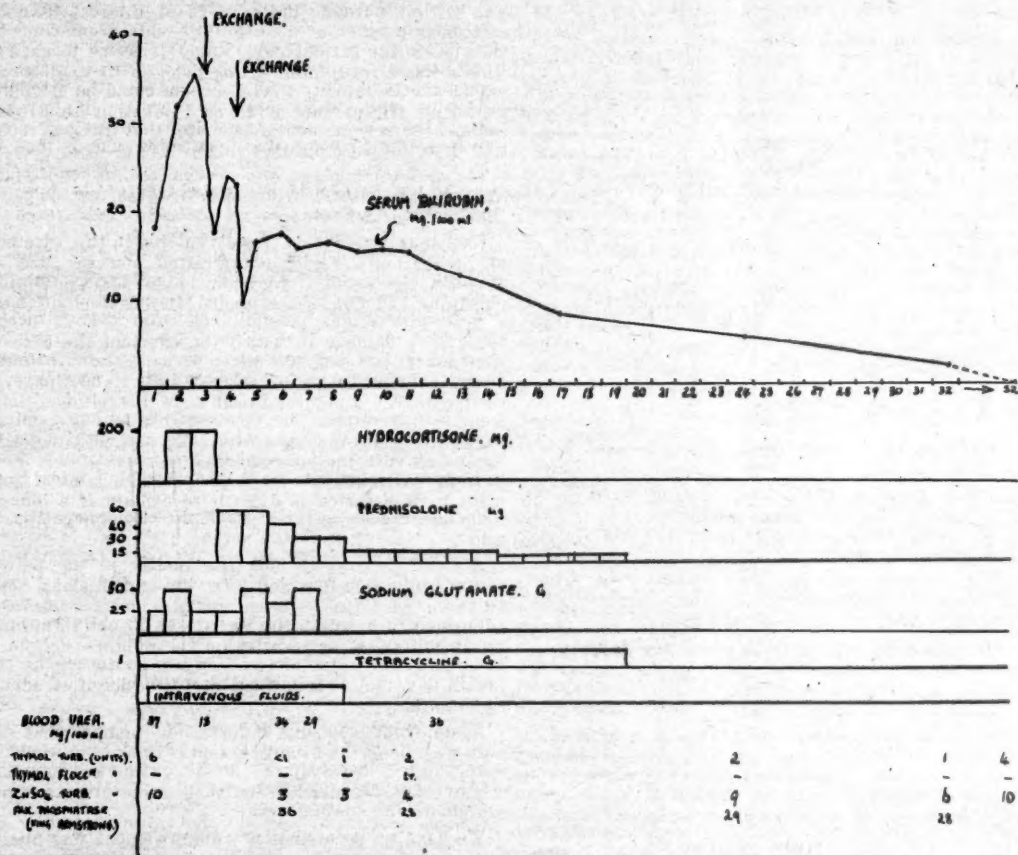


FIGURE 1.

Treatment.

The treatment given was as follows.

Fluids, consisting of 10% glucose in water with added potassium chloride and sodium glutamate, were administered intravenously from the second to the ninth hospital day. The volume of fluid was approximately 2000 millilitres per day, and the amounts of sodium glutamate are as indicated in Figure 1.

Hydrocortisone, 200 milligrammes per day, was given intravenously on the second and third days.

The administration of prednisolone was started on the fourth day and continued as indicated in Figure 1.

The administration of tetracycline, one gramme per day, was commenced on the patient's admission to hospital and continued to the nineteenth day.

A course of streptomycin, one gramme per day, was started on the sixth day and continued to the eighteenth, because of anticipated infection associated with the polythene tube.

Vitamin K was given on the first and third days. B group vitamins were given daily during the patient's illness.

during the first three days of the illness and was not tested for thereafter. The urine was heavily bile-stained and remained so for the first 17 days. The results of blood sugar estimations on the third, seventh and eighth days were respectively 364, 115 and 120 milligrammes per 100 millilitres.

Daily serum electrolyte estimations from the second to the eighth day showed serum bicarbonate values ranging between 32 and 34.6 milliequivalents per litre; pH estimations were not performed.

On the third day (Figure II) and before exchange transfusion, electrophoresis of serum proteins showed a normal pattern for albumin, alpha-1 globulin and beta globulin. The alpha-2 globulin was much decreased and gamma globulin increased.

On the sixth day (Figure III) electrophoresis showed that the albumin content was decreased, the alpha-2 globulin was much decreased and gamma globulin was slightly increased. The alpha-1 globulin and beta globulin contents were normal. The total serum protein content was 5.5 grammes per 100 millilitres (albumin 3.2, globulin 2.3 grammes per 100 millilitres); the albumin-globulin ratio

was 1:4. The amino acid content of a 300-millilitre specimen of urine was 0.25 milligramme per 100 millilitres.

On the tenth day the total leucocyte count was 20,000 per cubic millimetre, 18,400 being neutrophils.

On the fourteenth day the L.E. phenomenon was not detected. The Wassermann and Kline tests produced negative results. The result of the Paul-Bunnell test was negative. Aerobic culture of blood obtained on the day of admission to hospital was without result until the tenth

day. The patient's initial blood count was normal; he was afebrile, and remained so during the course of his illness, with the exception of a short period on the ninth day and again between the twenty-fifth and thirty-fifth days.

We thought that there was no evidence to support a diagnosis of leptospirosis or a haemolytic syndrome.

The patient and parents were questioned at length concerning the ingestion of toxic substances, and no history of this could be obtained. The arsenic content of his urine was within normal limits. It is of interest to note the relationship of the ingestion of chlorpromazine hydrochloride to the patient's symptoms. It seems to us that the illness was already progressing prior to its exhibition, and we believe it unlikely that his coma could be attributed to this drug. His parents, however, think that his drowsiness commenced several hours later and that his general condition deteriorated from this point.

We were intrigued by the swollen, red, unhealthy appearance of his gums, obvious in the first few days of his illness, for which we have no adequate explanation.

Exchange transfusion was considered in this case because of the patient's rapid deterioration and the lack of an absolute diagnosis. At this stage the possibility of poisoning had not been excluded. It was thought that such a procedure might possibly tide him over a period of acute liver damage in which the effect of the toxic agent was not prolonged. We were prepared to continue this method of treatment for several days if no improvement occurred. The time relationship to his clinical improvement is interesting. The fact that his jaundice, clinically, was less 36 to 48 hours after the second transfusion is consistent with the lag period which would follow decrease in tissue bile pigment. We believe that his clinical improvement in this period is difficult to explain if a long-acting toxic agent, such as the virus of infectious hepatitis, is the cause.

It is of interest to note the change in the pattern of serum proteins before and after the transfusions. The zinc sulphate turbidity figures are also interesting. On his admission to hospital, the figure was 10 units (normal one to six units). After transfusion these figures fell to three, three and four units, and rose to nine units on the twenty-fourth day, and at follow up, seven weeks after admission, to 10 units.

Apart from exchange transfusion, management of this case was along the usually accepted lines of protein restriction, high carbohydrate intake, vitamin supplements, attempted bowel sterilization with tetracycline, and sodium glutamate and steroid therapy.

We have no proof that any improvement was due to the exchange transfusions, and we realize that the course of hepatic coma is notoriously unpredictable. We also realize that we have established no adequate diagnosis in this case. In spite of these gaps, we have been so impressed with the improvement that we feel justified in reporting this case and asking for comment.

Acknowledgements.

We wish to thank the members of the pathology department of the Royal Alexandra Hospital for Children for their interest and help with this case, and Dr. R. J. Walsh for his advice.

A CASE OF ACUTE POISONING BY BENZENE HEXACHLORIDE.

By R. W. NICHOLLS,
Yackandandah, Victoria.

Clinical Record.

A MALE CHILD, aged 27 months, was examined by me at about 9.30 a.m. on May 2, 1957. The baby was completely unconscious and deeply cyanosed, and had severe spasm of the voluntary muscles. The parents said that the child

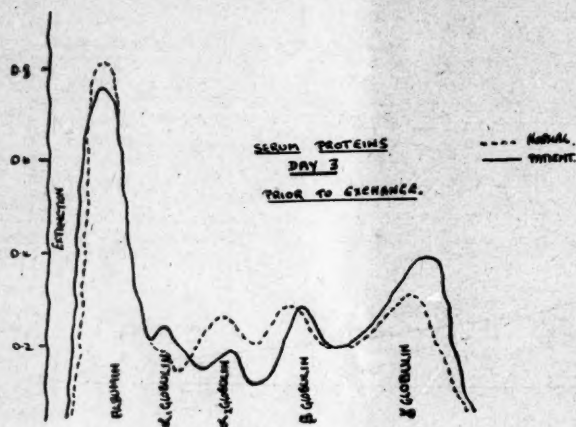


FIGURE II.

day, and then grew *Staphylococcus aureus*, coagulase-positive. Anaerobic culture produced no growth. The organism was sensitive to penicillin, streptomycin, tetracycline and chloramphenicol.

On the seventeenth day a 24 hour specimen of urine contained arsenic (calculated as arsenious oxide), 0.04 milligramme per litre. No mercury was found.

No specific agglutination reactions or culture techniques to detect leptospirosis were used.

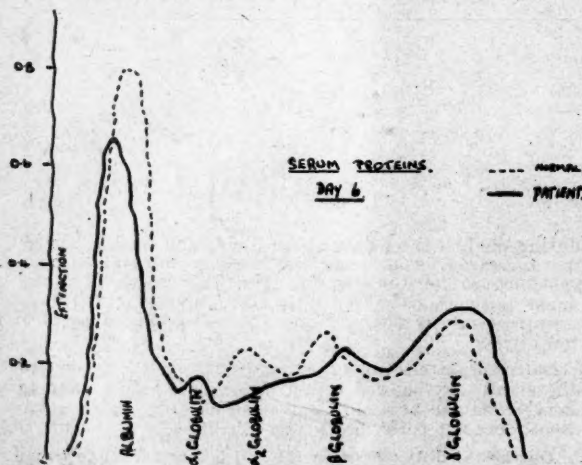


FIGURE III.

Comment.

The cause of hepatic coma in this child is not established. It is thought on clinical grounds that the most likely diagnosis is infectious hepatitis. Other factors considered were severe infection, leptospirosis, a haemolytic syndrome and poisoning.

Although a culture of *Staph. aureus* was obtained on the day of admission to hospital we believe that this is prob-

had taken by mouth one or more "Insectron fumigator pellets". These are sold in paper envelopes each containing 16 pellets. Each pellet weighs 0.275 gramme and contains 98% to 100% benzene hexachloride. Ten pellets had remained in the envelope, but it was uncertain how many the baby had ingested. The baby had taken the pellets about 8 a.m., and symptoms appeared half an hour to one hour later. The journey in took about half an hour.

The treatment given included prolonged stomach washouts with tap water for about two hours. The mouth had to be gagged open to admit the stomach tube owing to marked spasms of the masseter muscles. Oxygen, given by face mask under pressure, was effective in relieving the severe attacks of cyanosis. After telephone consultation with Dr. F. H. Shaw, Professor of Pharmacology, University of Melbourne, two doses of atropine sulphate (1/200 grain) were injected hypodermically and later one dose of sodium phenobarbital (one grain) was given by intramuscular injection.

The attacks of cyanosis and the tonic spasm of the voluntary muscles gradually decreased during the ensuing 12 hours. At 7 p.m. the child commenced to suck his thumb, and there were signs of the gradual return of consciousness. Next day the baby appeared out of danger and commenced to take food. He remained irritable for two days, but made an apparently full recovery in three days.

The child had been previously healthy, and I do not know of any epilepsy in his family.

Comment.

This case is reported on account of the unusual nature of the poison. The symptoms were similar to those of eclampsia.

HAEMOCHROMATOSIS WITH DIABETES MELLITUS.¹

By R. S. PATERSON, M.B., B.S. (Queensland),
Emmaville, New South Wales.

Clinical Record.

A MALE PATIENT, aged fifty-two years, was examined on August 4, 1956, complaining of symptoms of *diabetes mellitus*—lack of energy, loss of weight (from 13 stone to 10 stone 9 pounds), dryness of the skin, thirst, polyuria and left foot drop. During the previous 25 years he had been treated for peptic ulcer, the chief symptom of which was recurrent hæmatemesis (20 years and four years previously). At the time of consultation, the patient was on an unrestricted diet and 20 units of protamine zinc insulin per day; his urine consistently contained a large amount of sugar ("++++"). He complained of increasingly troublesome visual disturbances and loss of libido, and his lack of energy and general feeling of ill being had reached the stage of reducing him to a state of invalidity.

On examination of the patient, his general appearance was that of a middle-aged man, with obvious weight loss, as indicated by the looseness and wrinkling of his skin. There was a lack of ad fineness of hair, and the patient volunteered that hair had recently disappeared from his chest, legs, arms etc. The skin was of a faint slaty-blue colour. The cardio-vascular system and chest were normal on clinical examination. The liver was palpable four fingers' breadth below the right costal margin, and had a knobby firmness. There were no obvious signs of collateral venous circulation or of ascites. The spleen was just palpable. The urine gave a "++++" reaction to the Benedict test; the specific gravity was 1040, and ketones were present. Foot drop was present on the left side, and the knee and ankle jerks were reduced. X-ray examination of the chest revealed considerable elevation of the right cupola of the diaphragm, and the lung fields were clear. A blood examination gave the following results: the hemoglobin value was 16 grammes per centum, or 110% of normal; the leucocytes numbered 10,000 per cubic millimetre, 51% being polymorphs, 32% lymphocytes, 6% monocytes, 8% eosinophils and 1% basophils.

¹ This case was presented at the annual meeting of the Northern District Medical Association, Glen Innes, November, 1956.

X-ray examination with a barium enema and meal was ordered to exclude stomach or bowel neoplasm, and the possibility of secondary deposits in the liver.

Though the rarity of hæmochromatosis tends to make it of less practical interest to the general practitioner, it should not be forgotten when a case of *diabetes mellitus* presents, particularly a refractory one, as the prognosis of hæmochromatosis, though poor, is improved by insulin therapy, and indeed, in some cases, insulin has interrupted the progress of the malady. Correct management, as the present case demonstrates, makes all the difference to the life and comfort of the patient.

This patient, on inadequate insulin and without dietary guidance, had reached the stage of invalidity. On a diet which provides (i) adequate carbohydrate for his nutritional needs, with sufficient insulin to utilize it, and (ii) a high protein intake to compensate for the cirrhosis, this man has regained his lost weight, has lost many of his most distressing symptoms, returned to work and, most important, has regained his sense of well-being and believes that he will now live for many more years. The cirrhosis is given first place in treatment, as upon its management depends the nutritional status of the body. The diet therefore has a high protein and high carbohydrate content. The diabetes is managed by giving him sufficient insulin to utilize the amount of carbohydrate. His diet is one of 2600 Calories, which requires about 90 units of isophane insulin and 20 units of crystalline insulin to keep his urine relatively sugar-free. He is also being given added vitamins and lipotropic factors in the form of "Lipomin" (Parke, Davis), which contains methionine, choline, desicel, inositol and bethaine.

Discussion.

Hæmochromatosis is of interest, first because of the extreme rarity of the condition; Sheldon was able to collect only 311 authentic cases of hæmochromatosis in the entire medical writings on the subject. Only 34 cases were seen at the Mayo Clinic in 17 years (1923-1940), that is, two cases a year. Boulin reported 70 cases out of 4266 diabetics, an incidence of 1.6% among diabetics as a whole.

Hæmochromatosis is a disease of middle-aged males. It is unknown under the age of 20 years, and has its highest incidence between the ages of 45 and 60. Women are rarely affected, the malady being 25 times more common in men. On these figures, and using Boulin's percentage, one estimates that there are roughly 70 cases of this disease in Australia; but I have been unable to find in the literature confirmation of this actual number.

The aetiological basis is regarded as being an inborn error of metabolism, causing an abnormal retention of iron in the liver, spleen, skin and pancreas particularly, and in all other tissue except the brain and nervous system. Hence the foot drop in this case is simply a manifestation of diabetic neuropathy, and has nothing to do with the hæmochromatosis.

The normal body content of iron is three grammes. In these cases it may reach 25 to 50 grammes.

The liver is typically nodular, or hobnail, and on biopsy there are massive accumulations of hæmosiderin, both in liver cells and predominantly in extracellular areas.

On skin biopsy, the melanin normally present in the deep layers of the epidermis is found to be present in excessive quantities.

Diabetes mellitus accompanies the disease in 80% of cases, owing to pancreatic destruction by deposition of iron.

Summary.

1. A case of hæmochromatosis associated with severe *diabetes mellitus* is reported.
2. The literature is briefly reviewed.
3. The importance of recognizing the condition and the necessity for correct management are stressed.
4. Management is directed chiefly towards treating the hepatic insufficiency, and includes the taking of a diet of high protein, high carbohydrate content, with added vitamin and lipotropic factors, and sufficient insulin to utilize the large carbohydrate intake; consequently the dosage of insulin is usually of a fairly high order. On this régime, such a patient's life may be prolonged by some, even many, years with a minimum of symptoms.

Reviews.

Anatomies of Pain. By K. D. Keele, M.D., F.R.C.P.; 1957. Oxford: Blackwell Scientific Publications. 8½" x 5½", pp. 216, with 13 illustrations. Price: 27s. 6d. (English).

THIS is a most excellent book on the history of the anatomy and physiology of sensation in general and pain in particular. Our knowledge of the neurological pathways took a very long time to reach anything approaching the modern concept, for much speculation was indulged in and many theories were formulated throughout the centuries. Many of these were quite fantastic, some showed shrewd common sense assisted by simple experiments on animals, a few were accepted for long periods, but all suffered from one serious fault—no one had a detailed knowledge of the brain and spinal cord. It is true that the gross details of anatomy had been known for centuries; but no real advance was possible until the anatomy of the tracts could be worked out and, most important of all, their function determined. The work of Alexander Walker and Charles Bell in the early years of the nineteenth century laid the foundation for modern knowledge, soon to be expanded by François Magendie and further developed by W. Müller, Moritz Schiff, Charles Edward Brown-Séquard and Augustus Waller. By the end of the nineteenth century order had been established, and the detailed anatomy of the neurological pathways was well known.

Dr. Keele painstakingly recounts the many theories developed since the days of ancient Greece, and gives an excellent account of the work of the numerous anatomists and physicians. His chapter on the discovery of the spinothalamic tract is outstanding, and this is followed by an equally good review of twentieth century pain mechanisms.

Some readers will doubtless be put off by the rather oddly chosen title; but there is no doubt that they will be well rewarded by reading this most fascinating story of man's attempts to solve the mystery of the functional anatomy of the central nervous system. Dr. Keele deserves our congratulations for a very well-balanced and authoritative book.

The Labyrinth: Physiology and Functional Tests. By Joseph J. Fischer, M.D.; 1956. London and New York: Grune and Stratton, Incorporated. 9" x 6", pp. 217, with illustrations. Price: \$6.00.

THIS excellent little volume is essentially a clinical handbook, and should be of particular value to neurologists, ophthalmologists and otologists. It is unique in relating in the fullest possible manner all the available clinical and experimental material with the physiological background both theoretical and experimental—and this in a remarkably small compass.

The layout is most useful as an aid to easy reference, in that the functional tests are grouped in a separate section. Although this means a certain amount of duplication of subject matter, it renders the book a truly useful working manual.

Terminology is simpler than is usual in Continental publications, and the absence of circumlocution and clumsy word constructions will be appreciated by those who subscribe to American journals. The illustrations are not numerous, but are in the main helpful, and some of the line drawings are quite unusual. The reader is impressed with the work of a thoughtful and painstaking teacher. The impressive list of references shows how the centre of investigation of this subject has moved during the past few decades from Europe to England and America, and now, at least in part, back again to Europe. The author seems to combine to an uncanny degree the best qualities of both worlds.

A Guide to Blood Transfusion. By R. J. Walsh and H. K. Ward; 1957. Sydney: Australian Red Cross Society (N.S.W. Division) Blood Transfusion Service. 8½" x 5½", pp. 164, with 27 illustrations. Price: 20s. Australian.

THE standard text-books on transfusion, designed primarily for specialists, are inevitably becoming longer and more complex as knowledge increases. It seemed to the authors of this book that it is therefore growing more and more difficult for medical students, general practitioners, and even specialists in other fields to obtain a concise account, suitable for their needs, of the underlying principles and the techniques involved in the transfusion of blood or its products, now an integral part, in which they must share, of present-day medicine. This book was therefore written in the hope that it would be of help to this "wider audience". The com-

pression of its exposition of principles and detailed description of techniques into 164 pages is a noteworthy achievement.

Differences of opinion on various aspects of a lively and still rapidly developing and widening field such as blood transfusion are a healthy sign of active thought and interest. Other experienced workers therefore may not agree with some of the statements in this book; but a discussion and critical evaluation by the authors of various opinions and alternative techniques would be impossible in a volume of this size and, in fact, largely inappropriate to its purpose.

In addition to its anticipated value as a guide for those seeking practical help, this book should contribute to appreciation of the amount of knowledge, both wide and specialized, required by those in control of present-day blood transfusion services, and the unremitting responsibility which rests on them. It may help, too, to foster in the medical profession generally a discerning attitude towards the use of blood and its products, and an awareness of the care and consideration due to blood donors, without whom no treatment by transfusion would be possible.

The authors and the publishers are to be congratulated. The logical sequence of subject matter, the general format with well-arranged headings, the agreeably large print of the main text, and the generous measure of clear, uncluttered diagrams and figures together make reading of this moderately priced, small book pleasant as well as informative.

A Pocket Obstetrics. By Arthur C. H. Bell, M.B., B.S., F.R.C.S., F.R.C.O.G., Hon. M.M.S.A.; Fourth Edition; 1957. London: J. and A. Churchill, Limited. 7½" x 4½", pp. 164, with 15 illustrations. Price: 10s. 6d.

THE fourth edition of "A Pocket Obstetrics" maintains the standard of earlier editions. Some changes have been made in the text in accordance with certain advances in obstetric practice, though it is strange to find that plugging the vagina is still discussed as a form of treatment for revealed accidental hemorrhage. This little book succeeds in presenting concisely a sound outline of obstetrics for general practitioners and for midwives and is recommended for this purpose.

Medicine and the Navy, 1200-1900. By J. J. Keevil, with an introduction by Sir Henry Dale; Volume I—1200-1649; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 8½" x 6½", pp. 270, with several illustrations. Price: 40s.

IT is reassuring to find that a competent and experienced medical historian has undertaken the great adventure of writing the first comprehensive and definitive history of the British naval medical services. In an illuminating introduction to this, the first of two large volumes to be published, Sir Henry Dale assures us that the author, Surgeon-Commander Keevil, has the right qualifications for such an ambitious enterprise, in view of the circumstance that he "has had direct and personal experience of the Royal Navy's Medical Service as it is now, having served in it with distinction in war, as well as under conditions of peace, while, at the same time, he has acquired the interests and the equipment of a scholar and an historian".

In the preparation of his subject, Keevil has consulted every available record in the national archives, as well as reliable sources of information from far and wide. In this introductory volume early origins have been sought out from past ages where they hardly seem to exist; and the long narrative finishes at a point in the middle of the seventeenth century where, one imagined, it should actually have its beginnings. In fact, some readers may find their attention unduly strained and patience sorely tried by apparent discursiveness, detailed descriptions and frequent digressions relating to the establishment and functions of medieval hospitals, and the education and licensing of physicians, apothecaries, barbers and surgeons. There are many excursions into the political, religious and social history of England, the voyages of exploration and exploitation undertaken by intrepid navigators over the seven seas, and the various institutions closely or even remotely connected with seafaring long before a "Royal Navy" ever came into existence. The text is carefully documented throughout, and a chronology at the end of the book is helpful in sorting out stages in the development of a naval medical service.

It is certain that the two volumes, when completed, will be invaluable as reference books on most aspects of the medical and surgical care provided for those who have gone down to the sea in ships since A.D. 1200, whether in the Merchant Marine, in buccaneering or privateering

expeditions, in the reigning sovereign's own ships, or in the British Royal Navy from the time of Elizabeth I to the building up of that wonderfully organized and effective fighting-unit which characterized the Senior Service at the beginning of the twentieth century.

It is a matter for congratulation to both author and publishers that this first volume has been so handsomely produced, with literary skill added to that thoroughness and precision derived from the naval discipline and training of modern times.

Symptoms and Signs in Clinical Medicine: An Introduction to Medical Diagnosis. By E. Noble Chamberlain, M.D., M.Sc., F.R.C.P.; Sixth Edition; 1957. Bristol: John Wright and Sons, Limited. 8½" x 5½", pp. 520, with 374 illustrations. Price: 35s.

Most of us are already familiar with this book on clinical medicine, first published in 1936. The fact that it is now appearing in its sixth edition, as well as having been reprinted a number of times, is proof of its worth. The present edition is in the same general form as other editions, but detail has been modernized, if such modernization is possible in the subject of clinical medicine. Fortunately this subject is not static. Various diseases "come" and others "go". Important signs lose their significance, other signs are "discovered" and assume status. Forms of special investigation also change, perhaps even more rapidly.

We are thankful, therefore, that the subject of symptoms and signs in clinical medicine is ever changing, and that Dr. Chamberlain's editions keep up with contemporary fashion. This book still remains an excellent one for the undergraduate in his first approach to the clinical study of physical signs. However, we still consider the section on history taking and the description of symptoms less than adequate for the student. After all, most diagnoses are made on the history. The methods of special investigation are rightly placed at the end, but should be very useful to house physicians as well as to undergraduates.

The book is very well produced, and the illustrations, which are many, are well chosen. We congratulate the author and publishers and recommend this book to all students of bedside medicine.

The Student Life: The Philosophy of Sir William Osler. Edited by Richard E. Verney, M.B., F.R.C.P.E., D.R., with forewords by John Bruce, C.B.E., T.D., M.B., Ch.B., F.R.C.S.Ed., and Alec H. Macklin, O.B.E., M.C., T.D., M.D.; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 7½" x 5", pp. 228. Price: 15s. (English).

This little book is sincerely recommended to undergraduates and graduates alike. They would indeed be "real" doctors, worthy of their name and happier and more successful in both professional and private life, if they carried out its philosophy. The reprint is most timely. The book is interesting and stimulating; its aims and advice are excellent. To read a well-written book, the English language at its best and the mode of its use apposite to the context, is also a pleasure. However, one does wonder a little whether those who most need the advice and philosophy of this book and of William Osler will read it. The excellent advice is to some extent lost at times in the long, involved and wordy sentences. On the other hand, this very mode of writing may endear the book to the student of literature.

Inhalation Analgesia in Childbirth. By E. H. Seward, M.A., D.M. (Oxon.), F.F.A.R.C.S., D.Obst., R.C.O.G., and R. Bryce-Smith, M.A., D.M. (Oxon.), F.F.A.R.C.S.; 1957. Oxford: Blackwell Scientific Publications. 7½" x 5", pp. 68, with 11 illustrations. Price: 7s. 6d. (English).

This little book is another of those useful and authoritative publications of the monograph type which emanate from time to time from the Oxford school of anaesthetics. In its 60 pages it covers very completely a small, carefully circumscribed and very important piece of ground. It is addressed to English midwives, but can be read with profit by anyone concerned in any way with inhalation analgesia. The arrangement of the book is sensible and comprehensive. It begins with two chapters on the pain of labour, its causation and relief; then the next four chapters cover the practical application of the two anaesthetics, nitrous oxide and trichlorethylene. The next three chapters deal with the theory of analgesia caused by the two agents, and present a review of contraindications and causes of failure.

The book is written throughout in simple language, easily and completely intelligible to nurses. In fact, it would be almost intelligible to the average layman, but this simplicity

should not be mistaken for simplification; rather it is an excellent exposition of the doctrine that any subject can be written about in such a way as to be quite intelligible to a person educated in some other discipline.

The scope of the book is intentionally limited to nitrous-oxide-air and trichlorethylene analgesia for normal labour. Other agents—pethidine, for example—are mentioned, but not dealt with, and anaesthesia for abnormal labour and Caesarean section is not considered. The equipment mentioned is different from that usually in use in Australian hospitals, but the principles remain.

To sum up, this little book is written with common sense and understanding. It can be recommended to obstetric nurses and to doctors who require a quick and concise review of the subject. Also, in conjunction with other references, it will be useful to those concerned in lecturing to nurses and undergraduates. The bibliography is small but adequate, and the line drawings, moderate in number, are large and clear.

Preventive Medicine and Public Health: An Introduction for Students and Practitioners. By Fred Grundy, M.D., M.R.C.P., D.P.H.; Third Edition; 1957. London: H. L. Lewis and Company, Limited. 8½" x 5½", pp. 318, with 37 illustrations. Price: £1 5s.

This book is in the nature of an *apêrtif*; it lays no claim to be a text-book or to cover the whole field even in an elementary way. To this, the third edition, the author has added an olive in the form of an additional appendix containing suggestions for further reading for the student who wishes to read more widely in selected subjects.

Like most British books on public health, it contains much matter of no direct interest to Australian doctors. Six chapters and six of the seven appendices deal with administration and practice in the United Kingdom. But the remainder is all useful, and attractively written, particularly the historical chapters and the preliminary essay on the scope of preventive medicine. This and several chapters have been considerably amplified. Among them are Chapter IX, on heredity and health, Chapter XII on statistical methods and their uses, and Chapter XV on the control of infectious disease. Many, but not all, of the statistical tables and graphs have been brought up to date.

Among the added matter are comments on the proper use of the International Form of Medical Certificate of cause of death; these are as applicable here as in Britain, for this international form is now in use throughout Australia, and on the correctness of certification depends the accuracy of our statistics.

Perhaps the four chapters which form the section on "Principles" are the ones which the general practitioner who is also a part-time medical officer of health will find of most interest. Although they deal with "Principles", they do not treat them in any abstract manner, but are full of practical information; their emphasis, too, is on public health as it affects the individual as well as the herd.

Further mention must be made of the short list of references (some 90 in all) contained in the newly added appendix. Although the author modestly denies it the title of bibliography or the quality of comprehensiveness, it is an extremely useful list.

Altogether this is a very stimulating book, whose brevity should commend it to the busy general practitioner. Certainly the present edition should find a place in every medical library in Australia.

Schizophrenia in Psychoanalytic Office Practice: The Society of Medical Psychoanalysts, 1956 Symposium. Edited by Alfred H. Rifkin; 1957. New York and London: Grune and Stratton, Incorporated. 9" x 6", pp. 160. Price: \$4.00.

This is a collection of papers by 30 contributors to a symposium organized by the Society of Medical Psychoanalysts, which was held in New York during March, 1956. In accordance with the title, though the main emphasis is on extramural treatment, nevertheless there are several references to additional periods of psychotherapy conducted in mental hospitals, which were usually accompanied by somatic treatment. One of the outstanding contributions is that of Lewis B. Hill. He describes schizophrenia, not as a disease of unknown specific origin, but as "a way of life characterized by distance maneuvers, ideas of omnipotence, and preoccupation with inner reality, a way of life brought about by distortions in ego development which had their beginning in infancy, and tend to perpetuate throughout life. . . . When I speak of schizophrenia I am actually talking

about schizophrenic personalities. . . . When I see the schizophrenia, I do not say that the patient is not also hysterical, compulsive, or phobic. It seems to me there is this level of behaviour and, beneath it, this other tendency, which is defended against by the neurotic maneuver." Apparently Dr. Hill is influenced by Melanie Klein's experience through psychoanalysing young children. Another interesting contribution is that of Alexander Wolf, one of whose statements is as follows: "He [the borderline patient] is torn between neurotic adaptation and psychotic behaviour. He vacillates between good and bad love objects. He swings between introjection and projection. He identifies with his mother and father. He is sadistic and masochistic. He is hostile and detached. He wants to be close and isolates himself. He is aggressive and dependent. Needing his parents for security, he renounces his own ego for theirs. The patient gives up his own perception of reality and accepts the reality imposed on him by his parents. There is in fact some element of the borderline in all patients."

Injuries of the Hand. By Ronald Furlong, F.R.C.S.; 1957. London: J. and A. Churchill, Limited. 9½" x 6½", pp. 226, with 99 illustrations. Price: 36s.

THIS book, written by a member of St. Thomas's Hospital Orthopaedic Unit, is a worthy contribution to the literature on the subject. It is a rational approach, first detailing relevant anatomical considerations, and the basic technique of dealing with the injured hand. There follows a description of the methods of repair, in both the primary and the secondary management. These techniques are mostly standard, and are given with adequate illustration. Hand infection is briefly considered, and references are made to a new principle of "excision" following antibiotic localization of hand suppuration. Chapters dealing with the after-care and complications of reparative tendon surgery and nerve repair are of practical value to those undertaking this form of surgery.

Much of the latter part of this book is orthopaedic in its approach. The injuries of bone and joint and the syndromes relating to the hand are well dealt with. Furthermore, the consideration of less understood sequelae to injury, the "post-traumatic disabilities", is a welcome addition to this book. Very little is said about the plastic procedures of skin closure and replacement, for they are apparently considered to lie outside the scope of this work.

This is a book of value to the specialist surgeon, and to those who may through necessity find themselves confronted with the problems of hand trauma.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The Chemistry of Organic Medicinal Products", by Glenn L. Jenkins, Walter H. Hartung, Kenneth E. Hamlin, jr., and John B. Data; Fourth Edition; 1957. New York: John Wiley and Sons, Incorporated. London: Chapman and Hall, Limited. 9" x 6", pp. 580. Price: \$10.75.

"Extensively revised, introducing more and newer material on the mechanism of action of certain drugs."

"Medical Jurisprudence and Toxicology", by John Glalster, J.P., D.Sc., M.D., F.R.S.E., F.R.F.P.S. (Glas.), in collaboration with Edgar Rentoul, M.B.E., M.A., LL.B., M.B., Ch.B.; Tenth Edition; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 8½" x 5½", pp. 732, with 225 illustrations. Price: 47s. 6d. (English).

Fully revised since the previous edition was published in 1950.

"Advances in Radiobiology: Proceedings of the Fifth International Conference on Radiobiology Held in Stockholm on 15th-19th August, 1956", edited by George Carl de Hevesy, Arne Gunnar Forsberg and John D. Abbott; 1957. Edinburgh and London: Oliver and Boyd. 9½" x 6", pp. 520, with many illustrations. Price: 77s. 6d. (English).

The proceedings of a conference attended by about 180 delegates from 16 different countries.

"Aortography: Its Application in Urological and Some Other Conditions", by W. Barr Stirling, Ch.M., F.R.C.S. (Ed.), F.R.F.P.S.G.; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 9½" x 6½", pp. 300, with 155 illustrations. Price: 50s. (English).

A record of the angiographic findings associated with the major surgical lesions affecting the kidney.

"Scientific Tables": Documenta Geigy; Fifth Edition; 1956. Basle: J. R. Geigy S.A. 9½" x 6½", pp. 448, with illustrations. Price not stated.

An extensive collection of biological data and other related information set out so as to be readily available for reference.

"El Hipnotismo de Hoy", by Galina Solovey and Anatol Milechin; 1957. Buenos Aires: Ediciones "Dyaus". 7¼" x 5¼", pp. 288. Price not stated.

This is described as "a completely original work, based on the understanding that hypnosis is not an anomaly of behaviour, but an emotional state forming an integral part of daily psychological life". It is printed entirely in Spanish.

"The Collected Papers of Hugh Trumble", edited by Leonard Cox, M.D., R. S. Lawson, F.R.C.S., and T. E. Lowe, M.D., with a foreword by W. G. D. Upjohn, O.B.E., M.D., M.S., F.R.C.S., F.R.A.C.S.; 1957. Melbourne: Alfred Hospital in association with Melbourne University Press. 8¼" x 5½", pp. 328, with many illustrations. Price: 84s.

A tribute to a distinguished Australian surgeon.

"Roots of Modern Psychiatry: Essays in the History of Psychiatry", by Mark D. Altschule, M.D., with the collaboration of Evelyn Russ; 1957. New York and London: Grune and Stratton, Incorporated. 9" x 6", pp. 192, with 15 illustrations. Price: \$5.75.

A collection of essays on certain less usual aspects of the history of psychiatry.

"A Handbook on Diseases of Children: Including Dietetics and the Common Fevers", by Bruce Williamson, M.D. (Edin.), F.R.C.P. (Lond.); Eighth Edition; 1957. Edinburgh and London: E. and S. Livingstone, Limited. 7½" x 4½", pp. 494, with 117 illustrations. Price: 27s. 6d. (English).

The first edition appeared in 1933. Extensive revision has been carried out since publication of the seventh edition in 1953.

"Hospital Treatment of Alcoholism: A Comparative, Experimental Study", by Robert S. Wallerstein, M.D., in collaboration with John W. Chotlos, Ph.D., et al., with an introduction by Karl A. Menninger, M.D.; Menninger Clinic Monograph, Series Number 11; 1957. London: Imago Publishing Company, Limited. 9½" x 6", pp. 224. Price: 42s. (English).

The findings of a research project carried out over two and a half years.

"General Techniques of Hypnotism", by André M. Weltzenhoffer, Ph.D.; 1957. New York and London: Grune and Stratton, Incorporated. 9" x 6", pp. 480, with 24 illustrations. Price: \$11.50.

This book deals mainly with "techniques that underlie the production of hypnotic phenomena in general and which are applicable to most situations, as contrasted to the specialized techniques which have been developed in specific fields of application such as psychiatry and dentistry".

"Integrating the Approaches to Mental Disease: Two Conferences Held under the Auspices of the Committee on Public Health of the New York Academy of Medicine", edited by H. D. Kruse, M.D.; 1957. New York: Paul B. Hoeber. 10½" x 7", pp. 416. Price: \$10.00.

The aim of the conferences was to afford an opportunity to a group of experts who hold different views on the causality, pathogenesis and therapy of mental disease to come together, to engage in cross-exposition, and to plan research in common.

"Ten Million and One: Neurological Disability as a National Problem" Arden House Conference, sponsored by the National Health Council; 1957. New York: Paul B. Hoeber. 8" x 5½", pp. 128. Price: \$2.50.

This book is concerned with how a cooperative approach to the problem can hope to yield better results in diagnosis, treatment, management, education and vocational placement of the neurologically disabled.

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MEDICAL SECRECY.

IN daily practice respect for the principles of medical secrecy is assumed. Privacy is implied in the nature of the patient-and-doctor relationship. It is only when damages are awarded to a patient, whose confidences have been divulged, that doctors reflect on the precise meaning of medical secrecy. Such an instance is the verdict of a jury in the New Zealand Supreme Court, awarding £250 against a doctor who divulged confidential matters about a woman patient to the latter's husband. The woman stated in evidence that the doctor gave her husband a report saying that "she showed signs of paranoia". She knew nothing of the report until it was produced in court, when she instituted separation proceedings, on the ground of cruelty, against her husband. These were unsuccessful. Damages were sought on the ground that the doctor should not have reported to her husband on what was a confidential matter between herself and the doctor. The main defence was that, while a doctor must observe secrecy, cases concerning minors, mental diseases and some incurable diseases were excepted. The report aimed at safeguarding the plaintiff from hasty committal to a mental institution. Commenting on the verdict, the Chief Justice, Sir Harold Barrowclough, said that the British Medical Association code did not deal with a doctor's obligations as to secrecy when a husband and wife were involved, or even when there was a communicable disease. The case showed the need for more provisions in the British Medical Association code.

In Australia medical practitioners have always been advised that there is only one safe rule on medical secrecy—that is, that no confidential matter should be divulged, except when there is legal compulsion, or when the patient consents. Examples of legal compulsion are the obligation of notifying infectious diseases, and that of answering a question when ordered to do so by a judge. It will be shown that other seeming exceptions cannot be justified. The professional ideal is expressed in the Hippocratic Oath: "Whatever, in connection with my professional practice, or not in connection with it, I see or hear, in the life of men, which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret." The modern version of this is contained in the Declaration of Geneva (adopted by the World Medical Association at its meeting in September, 1948), which states *inter alia*: "I will respect the secrets which are confided in me."

The effect of both versions is to prohibit the disclosure of medical confidences, and since anything less would allow of many public mischiefs, the wisdom of society has considered that medical secrecy is justified by the public interest. Yet there are times when it would seem to be in the public interest that some confidence made by a patient to a doctor should be divulged. For instance, suppose that a doctor has a patient who is the driver of an interstate passenger express. He is aware that the patient suffers from general paralysis of the insane, and is unfit to drive a train on which a large number of passengers travel. In the public interest, should he not inform the patient's employers? It would seem that if he did so the patient could obtain damages for disclosure of a medical confidence. And the doctor's course should be only to explain to the patient why he should not drive the express, and urge him not to do so. For another example, it might seem to be against the public interest that a doctor should acquiesce in the concealment of an abortion. But in the English case of *Kitson v. Playfair*, the judge commented that at least in respect of an abortion already performed, he doubted whether a doctor would be justified in reporting it, "for such a thing would be a monstrous cruelty". Though dating from 1896, the decision in *Kitson v. Playfair* is quoted in all discussion of the right of patients to medical secrecy, even where disclosure might seem to be morally justified. Dr. Playfair attended the wife of his brother-in-law, who had been abroad for some twelve months, and he considered that an abortion had been performed. He communicated his suspicions to another relative, as he thought the wife guilty of misconduct, and suggested that her allowance should be stopped. This coming to the knowledge of the wife, she sued Dr. Playfair for divulging a medical confidence. She was awarded £12,000—£7000 more than she sought. This was later reduced to £9200. The position in some other countries, e.g., France, is that a doctor who divulges medical confidences is guilty of a criminal offence.

It has been urged from time to time that a medical practitioner should volunteer information which would lead to the discovering of crime, as when he is aware that an abortion has been procured. Yet the suggestion should be strongly opposed, since no one should be prevented from consulting a practitioner by the fear that his confidences may not be kept secret. A doctor will not take any share in the concealment of manifest crime, but it is not part of his duty to investigate suspicious facts, or to repeat hearsay statements, or to act as a police agent.

Among the Australian States there is no uniformity of legal attitude on the subject of medical secrecy. Thus in Victoria, information derived from a patient, and necessary to enable the doctor to treat him, is privileged in respect of civil actions. In New South Wales, a doctor giving evidence is not privileged to refuse information obtained under medical secrecy. He should at all times endeavour to preserve his patient's confidences, and should, unless with the patient's consent, answer questions only at the direction of the judge. If asked to divulge professional secrets his proper course should be to object and appeal to the judge. If ordered to do so, he may not then refuse; but the judge will not direct him in a manner which would be against the interests of justice. The

Queensland Parliament, when passing the *Medical Practitioners Act* in 1939, provided that a practitioner should be deemed guilty of misconduct in a professional respect in certain circumstances. For instance, upon obtaining information which indicates an attempted or completed crime, or any illegal operation, he must if possible call in another practitioner for consultation, and must impart his information, by the most speedy method of correspondence, to the Director-General. Similarly, when called to treat a person suffering from a wound, or from strangulation or asphyxiation, which he is not satisfied was accidentally incurred, he must advise the Director-General. Any other course would be misconduct.

With regard to abortion, the Royal College of Physicians of England some years ago obtained legal opinion, and agreed to certain resolutions, which were adopted in the following form, with the Crown Prosecutor's approval. The resolutions state: (i) That a moral obligation rests upon every medical practitioner to respect the confidence of his patient; and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her. (ii) That every medical practitioner who is convinced that criminal abortion has been practised on his patient should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced. (iii) That in the event of her refusal to make such a statement, he is under no legal obligation (so the College is advised) to take further action, but he should continue to attend the patient to the best of his ability. (iv) That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence, and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation. (v) That if the patient should die, he should refuse to give a certificate of the cause of death and should communicate with the coroner.

Generally, it cannot be said that medical secrecy is absolute; but it is very nearly so. The "secret of the confessional" is absolute, inviolable, whatever the consequences to society or to individuals. Nearest to this in strictness is secrecy between lawyer and client, though this is legal in nature, without the strong moral sanction of the confessional. The legal profession, while it clings to its privilege of secrecy, has not been willing to concede a like absolute privilege to the medical profession. Yet the courts, as in the New Zealand case, penalize a doctor who divulges a patient's confidences where public interest does not prevail over individual right to privacy. But the doctor, giving evidence in court, and trying to preserve his patient's confidences, must (in British countries) obey the order of the judge. If his medical conscience resists, he may be committed for contempt of court. Experts in ethics have suggested exceptions to the rule of secrecy. These would be mainly cases where to keep it would involve "disproportionate injury to the common good", or to an innocent person, or to the doctor himself, or to the patient. In Australia, since the doctor has only a qualified privilege, and this is not uniform in the various States,

there is only one safe rule. Medical confidences should never be divulged, except when there is legal compulsion to do so, or when the patient consents.

Current Comment.

TREATMENT OF HEPATIC COMA.

THE functions of the liver are numerous and complex, and our understanding of the physiology and pathology of this organ is still incomplete. Physiologists, biochemists and clinicians have not neglected the study of the liver, but it is difficult in experimental animals to reproduce the pathological lesions found in humans. Nevertheless, much progress has been made during the past twenty years, and a recent number of the *British Medical Bulletin*¹ reviews some of this newer work.

Hepatic coma is a well-established clinical entity with characteristic clinical signs and biochemistry. It may occur acutely in fulminating hepatitis and poisoning, or it may be precipitated in chronic liver disease by a variety of factors, including infections, surgery, gastro-intestinal hæmorrhage and alcoholic intemperance. Treatment aims at supporting the patient and removing provoking agents.² Dietary protein is stopped and glucose given as drinks, by intragastric tube or by intravenous injection. Fluid and electrolytic balance is maintained, and antibiotics are given in an attempt to control the so-called "intestinal intoxication". Sherlock, Summerskill and Dawson³ have claimed some success with chlortetracycline, and Fisher and Faloona⁴ have used neomycin. In view of the hypothesis that blood ammonia is important in the pathogenesis of hepatic coma, glutamic acid was suggested by Walshe⁵ to bind ammonia in the form of innocuous glutamine. However, it is now generally believed that glutamic acid therapy is of little value. Choline has not been helpful, and the amino acid methionine is dangerous because it cannot be metabolized by the failing liver. Corticoid hormones in large doses have been suggested for patients with fulminating hepatitis by Ducci and Katz,⁶ but their value is doubtful.

These measures, however, have proved disappointing when hepatic coma develops in patients with acute hepatitis or poisoning, and it is doubtful whether they have changed the high mortality rate. A new approach is suggested in this issue by Lee and Tink (see page 40), who treated a 13-year-old boy suffering from acute hepatic coma. The cause of the liver disease was not determined, but was possibly the sequel of infectious hepatitis. In addition to the usual treatment the authors inserted a polythene catheter into the inferior vena cava via the right femoral vein and performed two exchange transfusions. The first was with 3260 millilitres of blood and the second with 3140 millilitres. The bilirubin level of the blood was rapidly reduced on both occasions. Some 36 hours after the second exchange transfusion the patient was fully conscious and cooperative. Convalescence was uneventful, and seven weeks later he was apparently normal.

Lee and Tink have shown commendable caution in discussing the role of the exchange transfusions in the recovery of this patient, and they rightly point out that the rapid improvement is difficult to explain if a long-acting toxic agent, such as the virus of hepatitis, was responsible for the hepatic coma. Nevertheless, they have developed an interesting and novel method of supporting a patient until regeneration of liver tissue can occur. The liver possesses remarkable powers of regeneration, and recovery of weight, chemistry and function occurs within two or three weeks when two-thirds of the rat's liver is

¹ *Brit. M. Bull.*, 1957, 13: 75-152.

² *Brit. M. Bull.*, 1957, 13: 136.

³ *Lancet*, 1956, 2: 659.

⁴ *Brit. M. J.*, 1956, 1: 1357.

⁵ *Lancet*, 1955, 1: 1235.

⁶ *Gastroenterology*, 1952, 21: 357.

removed surgically.¹ It is probable therefore that an acutely damaged liver can recover if the patient is kept alive until the noxious agent is eliminated from the body.

In many respects the problem resembles that of acute renal failure, in which the object of therapy is to control the electrolyte and biochemical content of the blood and tissues until the glomeruli again function and tubular epithelial regeneration takes place. In liver failure exchange transfusions would be effective in reducing the bilirubin content of the blood and probably also in removing toxic materials normally metabolized by the liver, but they would play no part in eliminating the cause, such as the virus of hepatitis or the poison, from the body. Such exchange transfusions may have to be repeated frequently, they require a large amount of blood, and they are tedious to perform. This form of therapy is probably limited to the acute liver failure of hepatitis and poisoning, but in these conditions it is worthy of an extensive trial until simpler methods, such as dialysis, are developed to remove toxic materials from the body. A further problem will be the prevention of fibrosis during regeneration of the liver, and the value of the corticoid hormones for this purpose will require investigation.

COLDS AND ALLIED ILLS.

INFECTIONS of the upper respiratory tract, "colds" in one form or another, probably cause more ill health and disability than any other group of diseases. It is daily becoming more clear that most of these infections are viral, and that a large number of different viruses are concerned. Since no form of treatment has yet been discovered to cure these viral infections, it may seem a waste of time to classify them. But it is good to look at the size and the scope of the field to be covered. This has been done very well by C. H. Andrewes.²

Andrewes has been studying the problem for the past 25 years, and indeed was the first, with his colleagues, to identify the virus now called influenza A in 1933. This virus has since caused most of the important outbreaks of influenza throughout the world. The various outbreaks of influenza have shown epidemiological and other changes associated with antigenic changes in the virus sufficiently important to allow the virus to break through the herd immunity. Influenza A virus may cause local outbreaks at times not associated with national outbreaks. Influenza B virus tends to do the same, but it never causes outbreaks so widespread and severe. Vaccines can be prepared against both types, A and B; but while injection of type A vaccine may be useful in schools and the like, it is doubtful if type B vaccine is of much use. Influenza C is less important.

Sendai virus, discovered in Japan and belonging to the same family as the influenza viruses, causes pneumonitis in children, and its antibodies have been found in human blood in Europe and America. However, its importance in human disease is uncertain.

A group of viruses which has been much studied over the past few years is that of the adenoviruses. These were obtained originally from tissue cultures of human adenoids, but since then they have frequently been noted in various types of upper respiratory infection. All the adenoviruses show a common complement fixation, but 14 serological types have been isolated which react differently in the respiratory tract and conjunctiva. Types 1, 2 and 4 have been isolated from "normal" tonsils and adenoids, but they may cause respiratory infections in adults and children. Type 4 causes fever and sore throat. Type 3 does the same, sometimes with the addition of conjunctivitis. Type 7 is a common "cold" producer. Type 8 causes conjunctivitis, which may be severe, as also in certain cases does Type 3. The kind of respiratory disease which is produced by the adenoviruses is what has been called "febrile catarrh". Andrewes cites the following reports. B. M. Chanock isolated from infants suffering

from "croup" a virus which is probably a widespread cause of human infection. W. J. Mogabgab and W. H. Price have each recovered a virus from human subjects of mild coryzal infection. A. B. Sabin has isolated a virus from chimpanzees with an epidemic of "colds". Many human sera contain antibodies to this, so it may have spread from man to ape. Another similar virus was isolated by J. A. Morris, R. E. Blount and R. C. Savage. Andrewes states that there is no evidence that the so-called "gastric flu" is related to influenza or is caused by a virus.

When all these have been taken out, there still remains the large group comprising the "common cold". It is a particularly difficult condition to study, for, among other things, any immunity which may develop is extremely short-lasting; so when viruses are isolated they cannot yet be compared with other strains serologically, and it is not clear whether we are dealing with one disease or many. It has not yet been possible to carry any strain of the virus through more than ten passages in tissue cultures. All the work done at Salisbury on factors which may increase infection has produced negative results. Attempts have been made without success to show that resistance to colds can be lowered by chilling, wearing wet socks, standing in draughts and so forth. Direct contact seems to be the only efficient means of transmission, although infection can occur through clothes. Virus dried on handkerchiefs seems to lose its infection very rapidly. Doubtless more viruses will be found which can cause colds, and more success will be had in studying the virus of the common cold, but the field is a difficult one.

The treatment side of the question is at least as difficult, and it is clear that there is as yet no known treatment of any value in curing a cold.

DEATH OF MOZART.

IN the *Wiener Medizinische Wochenschrift* of December 22, 1956, there appeared an article by D. Kerner reviving an old rumour that Mozart had been poisoned by the composer and theatre director, Antonio Salieri, and diagnosing the toxic agent as mercury. This startling statement was included in a "Current Comment" in *THE MEDICAL JOURNAL OF AUSTRALIA* of May 4, 1957, the last two sentences being: "The editor of the *Wiener Medizinische Wochenschrift* in a footnote remarks that whilst the article is interesting he cannot accept Dr. Kerner's views in their entirety. That will be the attitude of most medical readers." In the *Deutsche Medizinische Wochenschrift* of June 7, 1957, Aloys Greither, of Heidelberg, subjects the story to a searching analysis, both historical and medical, and may be said to have destroyed the legend, as he calls it, root and branch. It is true that the rumour started soon after the death of the great composer, also that Mozart shortly before the end announced his conviction that he had been given poison, but the main cause of the gossip was the bloated (*gedunsen*) appearance of the body, and such a condition was regarded at the time by lay folk as conclusive evidence of poisoning. This nasty rumour died quickly, but was revived 30 years later, and about two years after this the name of Salieri was first mentioned in connexion with the supposed murder. Aloys Greither is merciless in his exposure of the faulty scholarship of the Vienna writer. The relations between Mozart and Salieri are now shown to have been not only correct but friendly, and furthermore there is mighty little in the condition of the dying musician which suggests mercury poisoning, no salivation nor any loosening of teeth. Fresh evidence in the form of contemporary letters is brought forward to prove that Mozart in his last days was in the hands of two capable doctors who would quickly and easily have detected mercurialism. The fatal condition was clearly uræmia of renal origin. Greither administers a severe and, many will think, a well-merited rebuke to Kerner for not taking ordinary precautions to verify his alleged charges and for his failure to deal with the signs and symptoms as a well-trained and unbiased physician should. This dismissal of the poison story and exoneration of Salieri will be accepted as definitive and final.

¹ *Brit. M. Bull.*, 1957, 13: 87.

² *M. Press*, 1957, 238: 391 (September 25).

Abstracts from Medical Literature.

OBSTETRICS AND GYNÆCOLOGY.

Recurrent Cancer of the Cervix.

A. BRUNSCHWIG AND W. DANIEL (*Surg., Gynec. & Obst.*, August, 1957) believe that at least 55% to 60% of patients with cancer of the cervix fail to be cured by radiation, the treatment of choice in the United States. Recurrences tend to remain localized to the pelvis for a relatively long time, and are by no means inoperable. Renewed radiation therapy has proved to be disappointing, Truelsen reporting less than 5% of three-year cures. In this paper the authors record the results achieved by extended surgical treatment in 84 cases of radiation failure or recurrence after operation five to nine years previously. The procedure carried out depended upon the extent of the disease. Thirty-seven patients underwent a radical procedure short of exenteration. If seven patients are excluded in whom the procedure was intended only to be palliative, 17 out of the remaining 30 survived five years, a 57% salvage. This illustrates the efficacy of proper radical surgery carried out for recurrent cancer of the cervix after radiation treatment when the disease is still localized to the cervix and its environs. Anterior pelvic exenteration was performed in 10 patients where the bladder alone seemed involved. There were 37 total pelvic exenterations for recurrences involving bladder and rectum. Excluding five total exenterations done for palliation only, there were altogether 42 patients with exenterations of whom eight, or nearly 20%, survived five years. In no other form of visceral cancer does radical surgery appear to offer such hopes for salvage as in this type of situation. The surgical mortality of exenterations (deaths within 30 days of operation) was 13%.

Radiation Dose from X-Ray Pelvimetry and Hysterosalpingography.

R. BERMAN AND B. P. SONNENBLICK (*Am. J. Obst. & Gynec.*, July, 1957) discuss the radiation hazards to the maternal ovaries and to the fetus, with special reference to the established diagnostic procedures of X-ray pelvimetry and hysterosalpingography. They mention the implied, but as yet unproven, risk to the offspring of future generations through germinal changes following diagnostic radiology. Measurements of intravaginal radiation doses are recorded in 28 patients subjected to X-ray pelvimetry or hysterosalpingography, and an attempt is made to evaluate the risk involved. The instruments used for the measurement in röntgens of radiation dosage are described. In order to evaluate and compare X-ray dosage, they consider it necessary to know the factors of exposure, the number of films taken, the calibration of the X-ray equipment and the means used to measure the radiation dose. The pelvic radiation was measured by interchangeable ionization chambers introduced into the posterior vaginal fornix during exposure of the films. A

standard technique was followed in X-ray pelvimetry, four films being taken of the different pelvic aspects: lateral view, inlet view, outlet view, and lateral view of the uterus. Total intravaginal radiation by this method ranged from 2.1r to 4.4r and averaged 2.9r. Twelve patients submitted to hysterosalpingography were given five, six or seven X-ray exposures, and the total dosage varied from 2.5r (five films) to 4.5r (seven films). The average intravaginal dose for each individual film was 0.6r and the average of the total pelvic dose was 3.5r. Fluoroscopy was not utilized in this series and it is stressed that this technique results in increased irradiation of the ovaries. The radiation dosage received by the foetus and the maternal ovaries during X-ray pelvimetry and the dosage to the ovaries incidental to hysterosalpingography are discussed. The genetic aspects of radiation dosage are briefly discussed in the light of present knowledge. The mutagenic effects of radiation on the germinal tissue of certain non-human organisms and plants have been established, but the authors consider these experimental data have, as yet, not been proven in the human and should be applied with caution. The entire dosage of radiation directed to any individual is derived from many sources, which include cosmic rays, natural sources, medical and dental X rays, as well as fall-out and waste materials from atomic power stations and reactors. They state that at present there is no firm knowledge in regard to the radiation level sufficient to produce genetic damage to future generations. In assessing the advantages of diagnostic X-ray pelvimetry and hysterosalpingography against the hazards of radiation effects, the authors consider that X-ray equipment should be calibrated and the factors of X-ray exposure should be selected to reduce the amount of radiation to the minimum consistent with quality films. They conclude that there is no proved contraindication to the diagnostic measures discussed if the technique is properly carried out.

Vaginal Candidiasis.

W. L. PICKHARDT AND J. L. BREEN (*Am. J. Obst. & Gynec.*, July, 1957) report a simple method of culture diagnosis for vaginal moniliasis and consider that a gentian violet cream preparation ("Gentersal Cream") is an almost ideal therapeutic agent. The authors suggest that other species of *Candida* apart from *Candida albicans* are capable of producing moniliasis in women. The mechanism whereby *Candida* becomes pathogenic is not known. They consider that a clinical diagnosis of candidiasis based on symptomatology and physical findings is not perfect, and cultures should be used to confirm the diagnosis. Twenty-three obstetrical patients and 50 gynaecological patients presenting with malodorous vaginal discharge, itching, burning and general discomfort were investigated for moniliasis by culture with Nickerson's medium. Treatment of these patients by "Gentersal Cream" is then reported. Discharge from the posterior vaginal fornix of all suspected patients was cultured on Nickerson's medium. This was allowed to incubate at room temperature

for 48 hours and was then read. A positive culture contained growth of discrete brown or jet-black colonies. If no growth appeared, the patient's specimen was considered negative for *Candida*. In a few instances additional cultures were made on Sabouraud's medium and were reported "negative" on this medium while positive on Nickerson's medium. The authors consider this to be due to bacterial growth on Sabouraud's medium overgrowing the *Candida* and giving a false negative result. Eighty-two per centum of suspected obstetrical patients gave positive results on culture and 70% of the gynaecological cases were proved. Routine treatment of candidiasis in this series comprised the intravaginal application of gentian violet cream by disposable applicators, inserted nightly for two weeks. If menstruation occurred during treatment, the daily applications were continued. Any type of douching was contraindicated during treatment. A routine post-therapy culture was taken two weeks after the completion of treatment, and if negative for *Candida* the patient was considered cured. If the culture was positive, another course of gentian violet cream was prescribed, and such treatment was repeated until a maximum of four courses had been prescribed. A maximum of two courses was used in the obstetrical cases, giving almost complete culture cure in the cases followed. Four patients required three courses of therapy, one required four courses, and one patient's cultures remained positive. The authors draw attention to the significance of associated vaginal infections causing persisting vaginal symptoms after eradication of the *Candida*. *Trichomonas vaginalis* was the most common cause of mixed vaginal infection.

Feminizing Mesenchymoma with Associated Endometrial Carcinoma.

J. W. GREENE, JUNIOR (*Am. J. Obst. & Gynec.*, July, 1957) reports a case of granulosa-cell tumour of the ovary associated with a carcinoma of the endometrium in a woman 33 years of age. A review of the literature since 1949 on feminizing mesenchymomas associated with endometrial carcinoma is presented, and available cases from the Ovarian Tumour Registry are reported. This report now brings the total number of instances of these combined tumours to 132, of which three were in patients under 40 years of age. The term feminizing mesenchymoma in this paper includes granulosa-cell tumours, thecomas and those tumours in which both types of cells are present. The association of granulosa-cell tumours with endometrial carcinoma was first reported by Schroder in 1922. Reports of feminizing mesenchymomas associated with endometrial carcinoma in the literature since 1949 show a preponderance of thecomas over granulosa-cell tumours, though the latter is much the commoner growth. In a total of 753 feminizing ovarian tumours collected from various teaching centres by Emge, only 25 endometrial carcinomas were found. The Ovarian Tumour Registry of the American Gynecological Society contains 289 feminizing mesenchymomas. Both the ovarian tumour and the endometrium were available for

study in 56 of these cases, and among these there were 13 instances of feminizing ovarian tumour associated with endometrial carcinoma. All but one of these patients were aged between 50 and 73 years. The ovarian tumour was a thecoma in eight patients and a granulosa-cell tumour in five. The outstanding symptom of these patients was post-menopausal bleeding. It is well established that feminizing tumours produce oestrogen, but the ability of this hormone to incite endometrial cancer has not been proved. In contrast to Emge's findings, some authors claim that 10% to 27% of feminizing mesenchymomas are associated with endometrial cancer.

Posterior Colpotomy in Pelvic Disease.

M. J. DALY (*Am. J. Obst. & Gynec.*, September, 1957) reports observations on 320 patients investigated or treated by posterior colpotomy, colpocentesis and culdoscopy at the Temple University Hospital during the period 1948 to 1954. Posterior colpotomy was performed 231 times, colpocentesis 191 times, and culdoscopy 17 times. Diagnostic colpocentesis was frequently performed before opening the cul-de-sac. The author considers that there are two requisites for positive diagnosis by needle puncture: blood or other fluid must be present in the cul-de-sac and the needle must be inserted into the fluid. A more accurate appraisal of the pelvic organs is possible if the cul-de-sac is opened, and in certain instances definitive surgical procedures such as salpingectomy or oophorectomy can be performed through the colpotomy incision. This method of diagnosis is considered particularly helpful in patients suspected of tubal pregnancy when blood cannot be aspirated by culpoentesis and in those with small adnexal tumours or unexplained pelvic pain. Recently, colpotomy has been advocated before undertaking vaginal hysterectomy. The chief indications for exploration of the cul-de-sac were: suspected ectopic pregnancy, suspected pelvic inflammatory disease, pedunculated pelvic mass. In 11 instances the cul-de-sac was opened for the purpose of performing an operation rather than to establish a diagnosis. These operations were: tubal ligation, bilateral oophorectomy, biopsy of pelvic mass, removal of prolapsed tube and removal of a foreign body. The technique for colpocentesis and colpotomy is described. Colpocentesis gave an inaccurate diagnosis in 19% of 191 investigations, and in another 10% the procedure was inadequate for establishing the correct diagnosis. In 10 cases of ruptured ectopic pregnancy the cul-de-sac tap was negative even though there was free blood present within the peritoneal cavity. It was possible to make a correct diagnosis in all but five cases after posterior colpotomy had been performed. The overall error in diagnosis was 28% with colpocentesis and 2% with colpotomy. There were 28 complications following colpotomy on the 231 patients in the series. These complications included: pyrexia due to the development or exacerbation of pelvic inflammation; four patients aborted after colpotomy; four patients had excessive bleeding

which warranted laparotomy; in three patients the recto-sigmoid was opened and two patients developed dyspareunia. The author stresses the importance of careful selection of patients for colpotomy in order to avoid complications. The cul-de-sac should be free and pliable. Colpotomy is contraindicated in cases of suspected appendicitis or any other bowel or upper abdominal lesion. An adherent recto-sigmoid, multiple pelvic adhesions associated with endometriosis, past infection or operation also contraindicate the operation. Adequate exposure is essential, and the operator is advised to cut the utero-sacral ligaments if additional room is required to carry out the necessary manipulations.

Culdocentesis.

R. H. McDONALD (*West. J. Surg.*, July-August, 1957) discusses the advantages, uses and interpretations of the culdocentesis or needle aspiration of the cul-de-sac of Douglas. The greatest value of the investigation is claimed in the recognition of atypical ruptured ectopic gestation. Cases are cited in which this procedure has been of proved diagnostic aid in specific pelvic infections, visceral trauma and neoplastic lesions. This procedure is simple and can readily be performed in the consulting room, and usually obviates the need for the operation of posterior colpotomy. No ill effects have followed puncture of the rectum on rare occasions through faulty technique. The author stresses the fact that no conclusion can be drawn from a "dry tap". The test may be repeated three times if necessary, and abdominal aspiration may be tried. Experience at the Detroit Receiving Hospital indicates that the history and physical findings fail to provide an adequate basis for laparotomy in 18% of suspected ectopic pregnancies. In many of these puzzling cases culdocentesis has quickly resolved doubt. A study of 395 consecutive patients with ectopic pregnancy during the six-year period 1949 to 1954 showed an uncorrected mortality rate of 1.2%; free peritoneal blood was present in 98.8% of cases; no blood was aspirated in 3.8% despite hemoperitoneum at the time of abdominal operation. Culdocentesis was considered the single most important diagnostic measure in 18% of suspected ectopic patients. Five cases are briefly reported, demonstrating the advantages of this procedure in atypical patients, especially those with partial rupture or "slowly leaking" ectopic gestation. The author considers that culdocentesis has a place in the diagnosis and treatment of pelvic inflammatory disease and affords a simple method of differentiating pelvic abscesses, hematocele or prolapsed hydrosalpinx. Large pelvic abscesses bulging the posterior vaginal wall should be incised and drained by the operation of posterior colpotomy, but small abscesses can be treated by needle aspiration, repeated if necessary. The aspiration of turbid, yellow-to-amber fluid suggests a probable diagnosis of acute salpingitis; a large amount of translucent yellow fluid which sometimes clots suggests the presence of a hydrosalpinx. Other unusual abdominopelvic conditions which have been diagnosed by culdocentesis include various

types of peritonitis, rupture of the spleen, liver, gall-bladder or urinary bladder, acute pancreatitis, perforated peptic ulcer and volvulus. Aspiration of peritoneal fluid through the cul-de-sac or through the abdominal wall has led to the diagnosis of intraabdominal carcinoma after centrifuging the fluid and examination of the sediment by smear cytology. The author mentions a recently described use of culdocentesis in determining tubal patency and ciliary activity.

Repeat Caesarean Section and Perinatal Mortality.

J. M. BUBALO (*West. J. Surg.*, July-August, 1957) has made a study of repeat Caesarean section in relation to fetal mortality, based on a series of 175 repeat Caesarean sections (46.6% of all Caesarean sections in the deliveries studied). He states that with the vogue of repeat Caesarean sections the added complication of fetal mortality of prematurity is becoming more evident. Approximately 5.5% to 7.5% of all vaginal deliveries terminate in premature labour. In the group of 175 repeat Caesarean sections under consideration there were 24 premature deliveries (13.7%). In eight of these cases premature delivery was necessary because the patients were in labour, had ruptured membranes or presented obstetrical emergencies. Thus 16 (9.2%) of repeat elective Caesarean sections were classified as preventable premature deliveries, since the time was selected by the operator. Of the 24 premature babies, six were lost. Of the 16 babies delivered by elective repeat Caesarean section three were lost. In addition, in that group of 16, five other infants showed respiratory difficulty, and prolonged resuscitation measures were necessary. Often the prematurity was more evident than real, as 43 of the 177 babies delivered (24.3%) weighed under five pounds 15 ounces. The author urges that more attention be paid to the estimated date of confinement in repeat Caesarean sections, and deplors the age-old dictum that such sections should be performed 10 to 14 days before the apparent estimated date of confinement. He holds that before the decision to operate is made the patient should be examined by abdominal palpation, and also that a digital examination of the cervix should be made, either rectally or vaginally; he prefers the latter. The criteria of elective induction of labour stated by W. F. Mengert should prevail in determining the time for repeat Caesarean section: the child should be of adequate size (seven to seven and a half pounds), the cervix should be partially effaced, and the external os should be dilated to admit one finger. From the seventh month until term the average foetus gains half a pound per week; therefore, when delivery is to be effected by repeat Caesarean section, the pregnant woman should be permitted to carry the infant as long as possible. If there is any doubt in such a case, it is wise to permit labour to occur spontaneously, rather than to perform Caesarean section in advance of the estimated date of confinement. If fetal mortality and morbidity in repeat Caesarean sections are to be reduced, then prematurity should be eliminated.

The Wider View.

OBSTETRICS IN CHINA.¹

The People's Republic of China is somewhat the size of Australia, but has a population of well over 600,000,000, which is increasing so rapidly that it has been stated that one in three of all the children in the world is Chinese. In company with 19 other Australian doctors under the leadership of Dr. Leonard Cox, I spent four weeks there in 1957. To appreciate what is really going on in the country, one would need to sit at the feet of Mao Tse Tung for as long a time as Marco Polo spent at the court of Kubla Khan, and one may still write as fabulous an account of it as Marco Polo did. We were shown so much that it is equally difficult to describe the impressions of four weeks in a short talk, so what I have to say is fragmentary and incomplete. It was collected from different people at different times and places. Our group had no official relation to any medical or political organization in Australia; but in China we were officially guests of the Chinese Medical Association, and irrespective of time or weather, their members met us and farewelled us at every point and some travelled with us throughout the trip. I, the only representative of our speciality, found the majority of obstetricians and gynaecologists to be women, and, particularly at Shanghai and Peking, women of considerable personality and ability. Although we always had interpreters with us, language was seldom a problem with the leaders of the medical schools and hospitals. We were told that the Chinese Medical Association is 40 years old and now has 43 regional branches in China. Membership is available to doctors two years after graduation who have "satisfactory records". The Association edits 16 journals with a circulation of over 200,000, including a bimonthly, *The Chinese Medical Journal*, which is published in English. This journal contains articles and reports in the usual Western medicine style, along with some dealing with traditional Chinese medicine, which is still popular with the people and is fostered by the Government, and I shall refer to it later. In recent years, 32 groups of doctors from 20 countries have visited China, as well as groups representing other branches of learning and culture. In fact, we soon discovered that we were on a "conveyor belt" of itinerary, and that the luxurious hotels we stayed in were not for tourists or for the Chinese people, but for visitors being shown around at the Government's expense. One had the impression that they wanted to show us and tell us their achievements, which are considerable. They did not appear to want anything from us except criticism, which was everywhere asked for. They were wonderful hosts, and those we met, who mostly knew the Western way of life, were very intelligent people with a good sense of humour. Their successors are likely to be indoctrinated with Communist philosophy, and unless their new medical leaders are allowed free world travel, their medicine is sure to suffer.

Now let me say something of their medicine, more particularly obstetrics and gynaecology as seen in the four centres of Canton, Hanchow, Shanghai and Peking.

One is immediately struck by the woeful shortage of doctors trained in Western medicine. This must have always been so, but the years of war and civil unrest and the expulsion of Europeans by the new regime have delayed the building up of an adequate medical community. In a country of 600,000,000 people there are said to be about 70,000 doctors. Nine times this number is necessary by our standards. To achieve this, not only buildings, hospitals and equipment are necessary, but men and women trained to teach increasing numbers of undergraduates. The medical leaders realize this, and are working hard at a long task. What priority the matter takes in the Communist scheme of things was hard to assess, but I was surprised to find magnificent new workers' sanatoria being built, while at the same time there is a great shortage of hospital beds. In the whole of China there are 39 medical colleges which are equivalent to our medical schools, but not affiliated with the universities. I saw four of these. The number of medical students varied from 1800 at Hanchow to 3235 in the Peking Medical College. Many more apply for admission than can be accepted, and selection was stated to be by examination and government decision; in all centres about half the students are women. All students live in hostels and work all the year, except for a two months' summer

vacation and two weeks off in winter, when they go to their homes. Their training and living are free, except for the better off, who may pay about £2 a month. The course lasts five years, which includes one year as an intern, and the pass rate in the final year is about 95%; but whether this means a high standard of study or a low pass standard, I do not know. It is generally conceded that the training period is too short, but at the present it is probably better to have the increased number of partly trained doctors. Despite this short course, some three hours a week are given to "political science", which consists of Marxist-Leninism, dialectical materialism, history of the revolution etc. Groups of students are encouraged to undertake special investigations during their course. Specialization starts early, during the clinical years of training, and considerably more time is then spent in practical work at that particular speciality. These budding specialists then become resident medical officers in the special hospitals, where after four years they become junior specialists and teachers as directed by the Ministry of Health. Teaching is in Chinese, mostly from translations of English and Russian text-books, but a Chinese text-book of obstetrics and gynaecology is at present being written in Shanghai.

Obstetric Teaching.

Students are taught obstetrics and gynaecology as one subject. As in Australia, they live in hospital for part of the time, but they cannot get the same amount of practical experience as here, for their groups are much larger than ours for the number of deliveries available. For example, in the Women's Hospital of the First National Medical College of Shanghai, which has 138 obstetrical and 114 gynaecological beds, students live in, in groups of 30, for four weeks in their fourth year, to do obstetrics and gynaecology. At their medical college they will have had 80 hours' lectures in these subjects. In all hospitals I was surprised at the large numbers of the medical staff. In the above-mentioned well-conducted hospital, which is in charge of Professor Wang, a charming woman who spent several years at the Johns Hopkins Hospital and spoke excellent English with a pleasant American accent, there was a senior staff of 28 doctors (visiting staff) and 30 resident medical officers. Certainly many clinics were conducted here. A pre-natal clinic, open six days a week, dealt with 20 to 25 new patients daily. There were also a toxæmia clinic, medical clinic, birth control clinic, labour instruction clinic and suspect dystocia clinic. In an endocrine clinic, some research was being conducted into vaginal cytology in pregnancy and in irregular uterine bleeding. A cancer detection clinic had started to look after a district with a population of 6000. All women aged over 35 years were being examined, and I was told that to date they had found five cases of invasive carcinoma among 350 women. One afternoon I gave an informal kind of lecture to about 30 Shanghai specialists. Their questions indicated that they were quite up to date. I spoke of our experiences with "Pitocin" given by the drip method and in preventing eclampsia, and soon found that they had practically no "Pitocin" to use, but plenty of eclampsics.

This highlights the whole problem of obstetrics in China. Of the population, 85% live in villages scattered all over the vast country, and devote almost their entire waking lives to farming tiny plots of land for an annual average income of no more than £15 (Australian). Here literally millions of babies are delivered by village midwives, of whom almost half a million are registered. In most instances ante-natal care must be absent or rudimentary. Many of these midwives have had only elementary training, such as first to wash their hands, secondly to cut their nails, and thirdly to apply a sterile dressing to the cord. Even these simple measures have reduced the puerperal sepsis rate, which was shockingly high in the country. Health stations are being developed on a district basis in and near to cities. The woman fortunate enough to attend a hospital pre-natal clinic receives care approaching our own. A large proportion of hospital admissions are emergencies, and at the Number 1 Hospital of Peking Medical College only *primiparae* and patients with abnormalities were admitted to the pre-natal clinic. In Peking 40% of the 120,000 yearly births are in hospitals, but this high percentage could not be current throughout most of the country. It is reasonable to assume that in the 25,000,000 births *per annum*, only a small percentage of patients receive pre-natal care as we know it and most are delivered in their homes. It follows that hemorrhage, sepsis and eclampsia are still great killers, and patients with these conditions arrive at the hospitals presenting serious emergencies.

Blood transfusion facilities are organized only in a small way as yet. Voluntary donors are lacking, and in some places donors receive payment. So great is the need to

¹This paper was read at a meeting of the Section of Obstetrics and Gynaecology of the New South Wales Branch of the British Medical Association on November 20, 1957.

conserve blood that everywhere it is the practice to collect the placental cord blood, which is typed and pooled accordingly and then examined by culture before use. It was admitted that this procedure deprived the baby of some blood, but in one hospital it provided as much as 15 litres of blood per year.

Antibiotics are in short supply, and none of the newer ones are available. Penicillin is being manufactured in Shanghai, and "Aureomycin" production has commenced, so many patients with puerperal sepsis must of necessity receive the treatment of pre-antibiotic days.

Where pre-natal care is absent, the eclampsia rate is high. It is high also in Hong Kong, where poverty defeats not only dietetics, but even the time required to attend antenatal clinics. In many instances pre-confinement admission to hospital would mean near starvation for the family at home.

Disproportion and uterine inefficiency would appear to be less common than here. The Chinese are smaller built women, but a high percentage of them must have gynaecoid pelvises. This is reflected in a relatively lower Caesarean section rate. I commented on this to Professor Chun in Hong Kong, where at the Tsan Yuk Hospital (the name means "Assist Birth"), among 7600 deliveries in 1956 the Caesarean section rate was 2.3%. A radiological survey of the female Chinese pelvis is being undertaken there. Another problem that the Chinese are spared is *erythroblastosis foetalis*, for only 1% of the population are Rh-negative.

It was difficult to collect hospital statistics for comparison with Australia, for although figures were freely available and the records I saw were well kept, the booked and the emergency cases were added together. The figures in Table I do not provide an entirely fair comparison, because the Chinese hospitals would have a greater proportion of serious emergencies to deal with than we do at the Women's Hospital, Crown Street.

In Table II the Chinese statistics were supplied by Dr. Shen, Director of Maternal and Infant Health in the Ministry of Health, Peking.

Many observers have noted that China's biggest problem is its increasing population, and the better the medical services, the greater will be the increase. Control of epidemics, the attack on what they call the "four evils"—rats, sparrows, flies and mosquitoes—the control of famine by better food distribution and rice rationing, control of floods by dams and afforestation, all diminish the natural death rate. Sparrows must be killed because they eat food, and for the same reason all the dogs in Peking had to be surrendered to be killed. At the same time, mounting industrialization increases the city population at the expense of the agricultural. This being realized, a vigorous campaign is being conducted to restrict the birth rate. Every hospital I saw had a well set up contraceptive clinic. A large department store displayed contraceptives, with explanatory diagrams. Sterilization of both sexes is urged, particularly if there are three children in the family. The most frequent operation I saw was tying of the Fallopian tubes; one woman was having the uterus emptied and her tubes tied through the posterior fornix at the same time. Males are sterilized under local anaesthesia in out-patient departments. Male sterilization was not popular with the women folk, and we gathered that the wife would prefer to be the victim. The answers to my questions about abortion varied slightly. I should think that there is no legal bar to abortion, but that each case is judged on its circumstances. Certainly, a woman who had three children and who wished no more could have her uterus emptied. Just how much pressure is put on people in any of these birth restriction procedures was hard to find out; but as each individual's personal activity is under the observation of a "street committee", persuasion could easily be used in any particular case. I was told in Shanghai that women workers in a factory had to report the appearance of each menstrual period and have the fact stamped on a card. This could be regarded as health supervision, but it would also keep a check on pregnancies.

Hospitals.

Only three of the eight hospitals I visited were recently built, and one of these was for the practice of traditional Chinese medicine. The new hospitals that I saw were strictly utilitarian in design; the interiors were somewhat drab and strictly economical in detail. Paint is in short supply in China, and the need for it was evident everywhere. Equipment was minimal, and a large proportion of it derived from pre-Communist days. The production of the great and varied equipment that modern technical medicine requires is at only a relatively early stage. In the meantime there is

"make do", for China's money available for outside buying is very limited, with priority for heavy industry.

The older hospitals had been built by church missions or were former private hospitals or converted clubs, usually with more recent additions. None had many beds for maternity or gynaecological patients, the largest I was shown having 252 beds (Shanghai). Labour wards have three or four beds with no screens. No anaesthesia is given for normal deliveries; I watched such a delivery, and was struck with the stoical Chinese silence.

TABLE I.

1956.	Hospital.			
	Hanchow Maternity.	Shanghai First Municipal.	Peking Number 1 Medical College.	Women's Hospital, Crown Street.
Deliveries	3489	5283	1200	4322
Maternal deaths .. .	19	8	—	2
Stillbirths and neonatal deaths .. .	3.3%	4.1%	2.3%	2.7%
Caesarean section rate ..	3.5%	4.0%	11.3%	1.0%

The most memorable hospital visited was the Chinese Union Medical College (formerly known as the Peking Union Medical College). This hospital would grace any city. It is built on the site of an old Chinese palace, in a garden area of many acres, surrounded by tall grey walls. In 1917 the Rockefeller Foundation started building it, and I have been told that each green porcelain roof tile cost the

TABLE II.

Place.	Birth Rate per Thousand.	Infant Mortality per Thousand.	Maternal Mortality per Thousand.
China	47.0	—	—
New South Wales ..	21.0	—	—
Peking, 1955	—	44.5	2.0
Sydney, 1955	—	22.7	0.64

Americans a dollar. Built in three-storied pavilions among well-kept lawns and trees, it is remarkably modern inside. A well-designed library is kept up to date with text-books in all languages, while 1100 current medical journals are taken. There are 500 beds divided into 18 departments with 23 clinics. In 1956 there were 290,000 attendances in the out-patient department. The hospital is devoted to post-graduate teaching only, and here are being made the future teachers. There are 192 on the teaching staff, and 350 post-graduates training at present. In the past many well-known Western doctors have taught here, including, in our specialty, Gordon King, now Vice-Chancellor of the University of Western Australia and Dean of the Faculty of Medicine, who went there in 1927, and later Nicholson Eastman. The present professor, Khatil Lim, is a slim woman with a striking personality. Her department is small—50 obstetric and 25 gynaecological beds—but a new women's hospital was being planned for an early date. It was curious to note that this large hospital area was not shown on a recent map of the city of Peking, whereas other hospitals and even a department store were.

Traditional Chinese Medicine.

This centuries-old system of traditional medicine is still strongly supported by the people and the Government, and there are four medical colleges which turn out some 150 practitioners a year, after a five years' course.

In each hospital I saw, there was a clinic for traditional medicine, and we visited a new 150-bed hospital in Shanghai entirely devoted to this system, although Western-trained consultants are used. A most interesting sight was a large out-patient clinic, in which treatment by acupuncture and moxibustion was in progress. Acupuncture needles are sharp, thin, stainless steel needles, which are slowly twisted

into selected points of the body. Seated and lying were patients of all ages and sexes, looking somewhat like the martyred Saint Sebastian, who litters the picture galleries of Europe; others were having small cones of some slowly burning material ignited over various muscle areas (moxibustion). There are some 2000 plant and herbal remedies in use, and an attempt is being made to evaluate these scientifically. It is fully possible that some have pharmacological value; as an example, crow's liver was used for pernicious anemia long before our use of liver, and ephedrine derived from a long-used Chinese plant. I was told that intractable dysmenorrhoea was often cured in the traditional medicine clinic, as were also some of the functional menorrhagias.

General Observations.

The bamboo curtain is, in fact, a short iron railway bridge about one and a half hours' train journey from Kowloon, the mainland station opposite Hong Kong. Here, there is tremendous activity, with some 3000 people crossing each way, every day. There is a railway station on each side of this border, the more modern one being on the Chinese side. Here we were entertained at an excellent Chinese meal before starting the four-hour journey to Canton. The Chinese trains are old and very crowded, but they are kept clean by sweepers moving through the carriages, and attendants keep freshening up pots of weak tea from large hot-water urns. Spittoons cater for the incorrigible Chinese habit of spitting. Chinese music, varied with exhortations to be a good citizen, is ceaseless, relayed from records to loud-speakers at each end of the carriages. In our longer journeys—one being 39 hours—we had special sleeping cars, which were comfortable, except for toilet facilities, which may have been physiological, but were not comfortable at 30 miles per hour. A walk through some half a dozen carriages to the dining car was quite fascinating, with the evil smell of goods of all types in the luggage vans—through carriages packed with Chinese sleeping or sitting in uncomfortable attitudes, many poring over small books of serial pictures with captions, rather like our comic strips. Children with parents were all in one carriage. A sleeping carriage had plain wooden bunks, three in layers one above the other, making 56 sleepers to the carriage. The great mass of the Chinese are accustomed to overcrowding and to living closely packed, without privacy as we regard it. This was apparent to us in Shanghai, when, after having been shown through one of the most crowded and poorest districts, we were taken to a new housing settlement, in which lived 20,000 people. This consisted of 406 two-storied buildings, each building housing 10 families. Two or three families might live in one room. A large room housed six to eight people, a small room three to six people. Five families shared one kitchen and 10 families one lavatory. The average wage of workers here was £A11 to £A15 per month, and the average room rented was 10s. per month. We went into several rooms, which were clean and tidy, but hopelessly full of beds and the personal belongings of two or three families. The information quoted is as given to us, and represents an advance on pre-existing living conditions. All able-bodied men and women in such a settlement would be employed for eight hours a day six days a week. The grandparents or the ill would attend to meals and housework and the literal swarms of children are well looked after in day nurseries, which we saw in action, within the settlement. Their education starts young, and no doubt follows a pattern approved by the Government.

Wage values are interesting. For instance, at a large steam turbine factory in Shanghai, the director received £A37 per month, but the chief engineer £A45. The average monthly wage of a worker was £A14, and the doctors in the hospital which was provided for the 3700 workers and their children, £A30. The highest paid individuals are the stage artists, who may earn £A180 monthly. The highest medical salaries are less than £A150 per month. Very few doctors could afford to own a motor-car, and their leisure hours are employed very differently from ours. There are no race meetings, spectator sports or cocktail parties to exhaust and distract. Saturday is like any other week-day in their hospital activity, and there may be conferences and meetings on Sunday. When we met them socially, as we often did at Chinese banquets, the many-course meal would finish at about 9.30, after which there would be polite handshaking and then home. We saw no evidence of night life, dance halls, or "café society". At least on the surface, everything is austere, the clothing is drab and uniform, and "sex" is at a minimum. For instance, in a vaudeville show which we attended in Peking, there was no long line of chorus girls, and in the street dancing on May Day for the most part men danced with men or girls with girls. The rarity of

a young couple swinging hands in the street surprised us, because the population is undoubtedly increasing. A young Chinese physician who was travelling with us, when asked about this, replied: "Love is in the mind." This is a long way from the emperors of the Ming and Manchu dynasties, who maintained the Forbidden City in the heart of Peking for the harem and its entourage. This magnificent collection of palace buildings is surrounded by a moat and tall, imperial red walls. It is now open to the people, and its buildings house wonderful collections of the art of the Chinese in past centuries. As a gynaecologist, I was interested in the progress of former emperors to the favourite concubine of the moment. Entering the Inner Court through the Gate of Heavenly Purity, they would reach the Palace of Heavenly Purity. Next came the Hall of Heavenly and Earthly Intercourse, after which the Palace of Earthly Tranquility.

Conclusion.

The colossal bureaucratic organization of the Chinese people may be likened to a pyramid, with the Standing Committee of the Politburo at the top and the street committees forming a broad base. Street committees are elected among relatively small groups, on a residential basis, and through these committees everything and everyone is organized and supervised; the doings of the group are discussed and instruction or correction is supplied. The Chinese have long been used to this lack of privacy, through their organization of the "family", which exerted strong control over its members. I have read that as long ago as 2000 years, the Emperor Shang Yang had the population organized into groups of "ten families". This family group had functions similar to the present-day street committees, and was made responsible as a whole for the errors of one. Out of this purposeful and relentless organizing of the individual, the Government has produced better living conditions for the vast majority—low as they may seem by our glossy, streamlined standards; but Richard Hughes, an English journalist recently in China, asks the question: "Who can strike the balance between freedom from starvation for a majority against the loss of freedom of thought for a minority?"

It may also be asked whether a civilization is capable of greatness without the unhindered flowering of creative minds. Only time will show if this is so. Meanwhile, Mao Tse Tung has said, "China has stood up", and nothing I saw would make me doubt it.

JOHN CHESTERMAN.

Sydney.

Medical Societies.

PAEDIATRIC SOCIETY OF VICTORIA.

A MEETING of the Paediatric Society of Victoria was held on October 10, 1956, at the Royal Children's Hospital, Melbourne.

The Problem of Dystalia.

DR. W. RICKARDS and MRS. R. BOTTOMLY presented a paper entitled "The Problem of Dystalia".

DR. J. WILLIAMS, in opening the discussion, said that the condition had been a worrying problem for many years. The cases had tended to swamp the Clinic. He thought that the speakers had thrown light on a difficult subject, about which present knowledge was incomplete. He asked Mrs. Bottomly's opinion of group therapy.

MRS. BOTTOMLY, in reply, said that she thought group therapy was important, but there was very little being done. The relationship of the therapist to the one child was often too limited and rigid, and the former played too dominant a role. In a group the therapist could stand aside and gain knowledge of the child and also present material pleasurable to the child. It was hoped to use that type of therapy more in future, combined with individual therapy.

DR. R. SOUTHER asked Mrs. Bottomly how often a child with moderately severe dystalia would attend for therapy, and what might be the duration of the treatment.

MRS. BOTTOMLY, in reply, said that the child would usually attend once a week for half an hour, the time being mainly limited by its availability. It was difficult to generalize about the duration of treatment, but improvement should take place in a few months.

DR. E. WILMOT asked Dr. Rickards whether, in country areas, where therapy was not readily available, it was worth

while arousing anxiety in the parents' minds when affected children were detected in school or pre-school examinations.

Dr. Rickards, in reply, said that as full an assessment as possible should be made by the examining doctor. In many cases, parental advice and understanding of speech as an interaction between the child and his environment would be helpful; but if the child was severely disturbed, if treatment facilities were not available, advice could often be harmful. Probably the school and the teacher could be of great help.

Dr. Willmot wondered whether it was even wise to have an assessment if one knew that no treatment could be offered.

Dr. Rickards said he thought that a lot could be done by the family doctor to help the parents.

Dr. R. WALL said that when he was in Newcastle-on-Tyne, he had found that they considered that children with uncomplicated dyslalia always recovered, and they did nothing. In family practice one did not find dyslalia continuing on to an older age.

Dr. Rickards, in reply, said that the symptom did disappear like all those associated with the maturation process. However, there really had been no studies to show what happened to affected children later.

Dr. E. PETERS spoke of some of the children who did not receive treatment. He said that he had occasion to see such children at a later stage, and found that they often seemed to be backward at reading and spelling. Most could read fairly well by the age of fourteen years, and had got rid of gross defects. The "s" sound was the most resistant defect. If the defects had not gone by ten years, they were usually permanent. However, in view of the large number of children who were known to have dyslalia at the age of six or seven years, it would appear that the majority of them did very well.

Dr. Williams, from the chair, said that one did wonder whether causing the child to lose hours of formal teaching by attendance at a clinic was the best system; but on the whole he thought speech therapy worth while. It helped the children a great deal, instead of their having to "sweat it out".

Preparation of Children for Tonsillectomy.

Dr. JULIE JONES read a paper entitled "Preparation of Children for Tonsillectomy" (see page 32).

Dr. J. WATERHOUSE, in opening the discussion, said that as a pilot study Dr. Jones's paper recorded an important piece of work; but it had to be seen in that perspective. It showed up well the problems encountered in that field of investigation. Dr. Jones had certainly made a very good effort to control many variables. The random assignment of groups, the structured background for interview material, the designs of follow-up at different stages, and the presence of a control group were all good features of the experiment. However, there were many features which could not be adequately controlled, such as "what was going on in the ward". The assessment of "improved, same or worse" was made entirely by the investigator, who knew which child was in each group; no trained psychiatrist or psychologist had made any observation of the children, and the assessment was all based on what the mother or the ward sister said. The fact that the control groups had, in the opinion of the investigator, shown more disturbance even before operation, was also a worrying point. The follow-up results appeared to be satisfactory at the level at which they were studied; but one could not be certain that greater disturbances were not present until the cases had been observed at greater depth. However, such a study as that was practically impossible in material of the present nature.

Dr. M. McLELLAND said that the way in which children reacted to anesthesia was important to her, and she congratulated Dr. Jones on tackling a difficult project. When one listened to Dr. Waterhouse, one realized that answers which could not be criticized would never be obtained, as the time and personnel necessary were from the practical point of view out of the question. Dr. McLelland thought that a child prepared for an anesthetic took a better anesthetic than one who was not; but the personal element was important, and the anesthetist should examine the child beforehand.

Dr. V. L. COLLINS said that Dr. Jones's study showed how difficult it was to draw conclusions. However, one did learn a lot about everyday problems from close contact with such patients. Referring to preparation of the child, Dr. Collins said that it was important for the child to have confidence in someone. However, it was difficult to know how far one should go in telling a child what was ahead. It was impor-

tant to know something of the child; the one who was disturbed could present a difficult problem.

Dr. W. RICKARDS said that the problem of preparation was a very personal one. A booklet was of doubtful value, because one did not know how it would be used or into whose hands it would fall. It was probably not a good thing to give to a disturbed child. It was not actually preparation but preparedness that was important. Set routines would not usually achieve that. The child who was important was the sensitized one, and the main consideration was not so much what was said to him, as the personal relationship with the one who was saying it. If the child knew that the parent believed it was all right, that was what mattered.

Out of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

THE NORTH QUEENSLAND MEDICAL SOCIETY.¹

[From the *Australasian Medical Gazette*, February, 1890.]

THE rapid advance that is being made in the Settlement of Australia is very forcibly shown by the foundation of a medical society in Northern Queensland, the meetings of which are to be held at Townsville and Charters Towers alternately, and the annual meeting is to be held at Townsville. The new society is, we are informed, receiving the almost unanimous support of the medical men in the north, and it must be of service not only to its members but to the public of that portion of Australia. We say this because it is an infinite gain to the patients that their medical attendants should by social intercourse and conversation keep themselves abreast of the times in all advances of medicine. No doubt this can be done by reading, but much more effectively by discussion such as is brought about by the meetings of these societies. The district of which this Society will be the professional centre is situated entirely in the tropics, where there are doubtless in a new country fresh types of disease calling for accurate observation which will be promoted by such an Association. As an example of the progress of these districts we may add that when we visited Townsville there was no medical man in Australia north of Bowen, whilst now medical practitioners are so numerous as to lead to the foundation of a medical society.

Correspondence.

PROCEEDINGS OF THE TWELFTH INTERNATIONAL CONGRESS ON OCCUPATIONAL HEALTH.

SIR: In July, 1957, the twelfth International Congress on Occupational Health was held at Helsinki, Finland, under the auspices of the Permanent Committee and International Association on Occupational Health.

I have been requested by the Organizing Committee of the Congress to make known the fact that the Congress publications are to be issued in the form of an "International Review on Occupational Health". It has been suggested that medical practitioners interested in occupational health may wish to secure a copy for themselves or for the library of the department or organization with which they are associated.

The publication is to be issued in three volumes: Volume 1 contains 32 reports on a variety of subjects; Volume 2 consists of summaries of 245 papers; and Volume 3 comprises the proceedings of the Congress. The total price quoted for the three volumes is 3500 Finnish marks, but each can be obtained separately at the following prices: Volume 1, 1000 Finnish marks; Volume 2, 600 Finnish marks; Volume 3, 4000 Finnish marks. £1 (Australian) is equivalent approximately to 720 Finnish marks.

¹From the original in the Mitchell Library, Sydney.

Orders may be placed directly with the Organizing Committee in Finland, and I should be pleased to supply order forms and leaflets relating to the publications to any medical practitioner who desires them.

Yours, etc.,

GORDON C. SMITH.

School of Public Health and Tropical Medicine,
University of Sydney,
Sydney.

December 16, 1957.

WILLIAM HARVEY.

SIR: In this tercentenary year of Harvey we have been edified by many learned lectures on his undoubtedly great contribution to medical science. It is perhaps appropriate to mention the more homely side of his character, so far ignored.

I quote a pen picture of him by that scandalmonger of the seventeenth century, John Aubrey: "Had he been stiffe, starcht and retired as other formall Doctors are, he had known no more than they for Pride has been one of the greatest stoppers of the Advancement of Learning. . . . He was wont to say that man was but a great mischievous Baboon. . . . He kept a pretty young wench . . . which I guess he made use of . . . as King David did. . . . After his Booke of the 'Circulation of the Blood' came out . . . 'twas believed by the vulgar that he was crack-brained. . . ."

Yours, etc.,

"INTERESTED ONLOOKER".

Melbourne,
December 12, 1957.

NEUROSURGERY AT HOME AND ABROAD.

SIR: Would it be possible to publish relevant information concerning the child who was recently sent abroad in a blaze of publicity and at great expense for an operation for a cerebral tumour? It must have amazed a number of the medical profession in this country to learn that our skilled neurosurgeons were unable or unwilling to deal with what appears to have been a straightforward case. I am sure it would be an advantage all round to learn our technical shortcomings in this highly specialized field of medicine. We would like to be able to reassure our patients that the most difficult and complicated neurosurgery can be dealt with in our home country.

Yours, etc.,

JOHN D. MAUDE.

82 Market Street West,
Wollongong,
New South Wales.
December 11, 1957.

SIR: Whilst sections of the Press confuse a cash box with their conscience, Mr. Douglas Miller can take comfort in that "the tense drama of flight to foreign lands" provides some compensation for subsequent surgical failure, at least to the surviving family.

To an Australian, is England much less foreign than Sweden? To an Asian, is our country so familiar? Let who can, go where they will. Let who will, come here if they can; and measure our success in the balance of exchange.

Yours, etc.,

DOUGLAS VANN.

Macquarie Chambers,
Massie Street,
Cooma,
New South Wales.
December 16, 1957.

IDENTICAL SKIN ERUPTION IN FIVE MEN AFTER MASSIVE EXPOSURE TO JELLYFISH (AURELIA).

SIR: I was interested in the report by Dr. Hanns Pacy under the above title in the Journal of October 19, 1957, page 680.

The delay in onset of 16 hours seemed incompatible with stings by the nematocysts of Coelenterata. It suggested, supported by the appearance in the photograph, clinical course, and relief of itching by antihistamines, that the

brothers had more probably suffered from "bathers' itch", which is caused by cercariae of avian schistosomes attempting to penetrate the skin. As the cercariae are little more than half a millimetre in length (Bearup¹), they would not be discovered unless specifically searched for.

I consulted Professor W. V. Macfarlane, Department of Physiology, University of Queensland, and Mr. A. J. Bearup, School of Public Health and Tropical Medicine, University of Sydney, both of whom have worked on schistosome dermatitis. They agree with this hypothesis, and Mr. Bearup also pointed out that the time of year (December) is a good one for emergence of cercariae, and that *Zostera* beds, a favoured habitat of the molluscs in which they develop, are said to be common at Tea Gardens.

It seems desirable to record this alternative hypothesis, because there has been no previous suggestion that the nematocysts of *Aurelia* might be toxic.

Yours, etc.,

I. M. MACKERRAS.

Queensland Institute of Medical Research,
Herston, N.9,
Queensland.
December 18, 1957.

SIR: Dr. Mackerras's lucid interpretation of my case report must certainly be considered, especially in the light of Mr. Bearup's recent paper.

From the available facts it is impossible to exclude schistosome dermatitis. The cases were the only ones of this type brought to my notice within over three years in the district. It is, however, possible that they may recur, also elsewhere. And it may be possible at such a future event to get perhaps an earlier sample of sea-water, as well as sending this to Mr. Bearup for testing.

Yours, etc.,

HANNS PACY.

37 Rowe Street,
Eastwood,
New South Wales.
January 2, 1958.

CHRONIC BRONCHITIS—AUSTRALIAN VIEWPOINT.

SIR: I am grateful to Dr. Brand for his comments (M. J. AUSTRALIA, December 21, 1957), and agree that numbers of children are labelled bronchitic when they are, in fact, asthmatic. In Australia, true chronic bronchitis is virtually unknown in childhood except in association with bronchial asthma or bronchiectasis, and I agree that children with a clinical picture resembling that of chronic bronchitis must be carefully assessed to exclude other illnesses.

In contrast with the above, most asthmatics who develop chronic bronchitis proper, as opposed to episodic bronchitis, do so in adult life, and in adults an incorrect diagnosis of bronchial asthma is often made in those with chronic bronchitis.

To advocate the wholesale skin testing of chronic bronchitics would involve the investigation of very large numbers in whom asthma and/or allergy could be excluded as an aetiological factor on clinical grounds. As the determination of skin sensitivity is merely a prelude to "de-sensitization", this step will only be taken in the residue of patients by those who believe that this latter is of value in the management of bronchial asthma.

I must confess to being sceptical, but do not wish to enter a field of such controversy when it is outside the scope of my paper. There appears to be definite need for the scientific evaluation of this procedure, and this must be carried out by controlled clinical trial using the "double blind" technique, so that neither the patient nor those responsible for the appraisal of results know to which group he belongs.

Yours, etc.,

BRIAN L. MARKS.

2 Collins Street,
Melbourne, C.1.
January 1, 1958.

SUPERVOLTAGE RADIOTHERAPY.

SIR: After operating recently upon a case where cobalt beam therapy had failed, it seemed appropriate to ventilate certain matters relevant to this therapy.

¹ *Parasitology*, 1956, 46: 470.

It is scarcely proper that most of the information available to the medical profession in the local theatre should emanate from the lay Press. Much of the published material appeared to be more concerned with embarrassing the Government or raising funds than with the proper perspective of supervoltage therapy in modern cancer management in New South Wales.

The death rate from cancer in Australia is of the order of 130 per 100,000 of population. This death rate has altered little over the last 30 years. It is unlikely that any method of treatment at present available will alter this state of affairs unless some entirely new principle in therapy emanates from some research programme. Acting on this viewpoint, the New South Wales Government, strongly supported by the medical profession and the University of Sydney, has devoted much of its slender resources to research. In fact, it has outshone any other Government in Australian history in this regard. For this foresight it has neither received nor asked proper public recognition.

Cobalt supervoltage therapy has now been in use in New South Wales for a year. It seems appropriate, therefore, to suggest that the British Medical Association should request the proper authorities to set up a representative professional committee (chiefly clinical, not solely radiotherapeutic) to begin a review of the results. If such an organization were now established, the information which it could make available to the medical profession in the next few years would clarify the role which this type of therapy should occupy in our armamentarium.

Further, a comparison of the results and effects of this type of treatment would be readily made with those achieved by conventional radiotherapy in our major hospitals, and particularly with those of the different types of supervoltage installations being used in the other Australian States.

These accumulated experiences might guide the responsible authorities in planning the proper installations and organizations essential to the present and future use of advanced radiotherapeutic techniques.

Yours, etc.,
K. W. STARR.

149 Macquarie Street,
Sydney,
December 31, 1957.

Post-Graduate Work.

THE MELBOURNE MEDICAL POST-GRADUATE COMMITTEE.

PROGRAMME FOR FEBRUARY, 1958.

Gynaecology and Obstetrics Refresher Course.

A GYNÆCOLOGY and obstetrics refresher course for recent graduates will be conducted at the Royal Women's Hospital, Carlton, full-time, for two weeks from February 10 to 21, 1958. It will consist of lectures, demonstrations and ward rounds by members of the staff. Limited residential accommodation will be available at the hospital. The fee for the whole course is £10 10s., payable to the Melbourne Medical Post-Graduate Committee. Board and lodging, at £7 10s. per week, is payable to the hospital. Commencement of the course depends on the receipt of a satisfactory number of enrolments, which should be sent to the committee by January 23.

Country Courses.

Bendigo.—On Friday, February 21, at the Bendigo Base Hospital, at 8 p.m., Dr. J. B. Foster will discuss "Common Eye Conditions—Diagnosis and Treatment in General Practice". The local secretary for this course is Dr. A. J. Walters, 514 High Street, Golden Square, Bendigo. The fee is 15s., but those who have paid an annual subscription to the committee are invited to attend without further charge.

Flinders Naval Depot.

At Flinders Naval Depot on February 12, at 2.30 p.m., Dr. Patricia Wilson will speak on "Recent Developments in Anaesthetics". This course is being held by arrangement with the Royal Australian Navy.

Courses for Higher Qualifications.

A course in anatomy will be held at the Anatomy Department, University of Melbourne, for M.S., M.G.O., D.G.O., D.O., D.L.O., D.P.M., D.A., D.D.R., D.T.R., D.C.R.A., Primary F.R.A.C.S., and F.F.A.R.A.C.S., at 2.15 p.m. on Mondays and Wednesdays, commencing on February 24.

A course in physiology will be held at the Physiology Department, University of Melbourne, for M.D., M.S., M.G.O., D.G.O., D.O., D.L.O., D.P.M., D.D.R., D.A., Primary F.R.A.C.S., and F.F.A.R.A.C.S., at 3.45 p.m. on Mondays and Wednesdays, commencing on February 24.

A course in pathology will be held at the Pathology Department, University of Melbourne, for M.D. candidates and as a basic course for candidates for Part II of the M.S. and the diplomas, from 1.30 p.m. to 3.30 p.m. on Mondays and Wednesdays, commencing on March 3.

Enrolments.—Enrolments on the committee's form and accompanied by the fee will be accepted by the Post-Graduate Committee until two weeks before the start of the course. Fees are £21 per subject. The total fee for Part I D.D.R. is £42.

MARCH.

Course in Surgery.

The honorary surgical staff of the Royal Melbourne Hospital will conduct a course in surgery suitable for candidates for senior surgical qualifications, commencing on March 17 and continuing till April 24. This will consist of classes in clinical surgery at 4 p.m. on Mondays, Tuesdays, Thursdays and Fridays. Permission will be obtained for all members of the classes to have access to the operating theatres and general surgical work of the hospital. The fee for the course will be £10 10s., and enrolments should be made through the Melbourne Medical Post-Graduate Committee. Entries close on February 28, 1958.

Course in Anaesthesia and Medicine.

Attention is drawn to the course suitable for candidates for F.F.A.R.A.C.S. and others, to be conducted by the Faculty of Anaesthetists, Royal Australasian College of Surgeons, Victorian State Committee, from Monday, March 17, to Friday, March 28, with lectures each day from 11.15 a.m. through the afternoons, and an evening lecture on Wednesday, March 26. The fee for the course is £10, for half the course or less £5. Cheques are to be made payable to the "Royal Australasian College of Surgeons Trust Account", and enrolments made through Dr. Ralph Clark, Honorary Secretary of the State Committee of the Faculty.

INQUIRIES.

The address of the Melbourne Medical Post-Graduate Committee is 394 Albert Street, East Melbourne. Telephone FB 2547.

THE ROYAL NORTH SHORE HOSPITAL OF SYDNEY.

Seminars and Case Demonstrations.

THE following is the programme for seminars at the Royal North Shore Hospital of Sydney for 1958: February 4, "Lupus Erythematosus", Dr. R. D. Puffett, Dr. E. B. Durlie, Dr. C. S. Graham; March 4, "Indications for Mitral Valvotomy", Dr. D. S. Stuckey, Dr. R. G. Epps, Mr. Ian Monk; April 1, "Treatment of Rheumatoid Arthritis and Ankylosing Spondylitis", Dr. P. J. Benjamin, Dr. R. G. R. Robinson; May 6, "Vertigo", Dr. I. A. Brodziak, Mr. J. B. Dowe, Dr. G. Selby; June 3, "Prevention and Treatment of Tetanus", Professor P. de Burgh, Dr. F. Hales Wilson, Dr. J. D. Harley (Royal Alexandra Hospital for Children).

The seminars will be held in the students' lecture room at 5.15 p.m. on the first Tuesday of each month. On the remaining Tuesdays at this time there is a clinical demonstration of medical cases.

Public Health.

POLICE OFFENCES (AMENDMENT) ACT, 1908, AS AMENDED, OF NEW SOUTH WALES.

THE Under Secretary, Chief Secretary's Department of New South Wales, has requested that the following announcement should be made.

An amendment to the Drug Regulations under the *Police Offences (Amendment) Act* will be published in the *Government Gazette* on Friday, December 20, 1957, requiring that as from April 1, 1958, drugs to which the Act applies shall be stored apart from other goods. The relevant Regulation as amended is set out hereunder, the amendments being in italics.

Storage.

10. Every person authorised to procure and supply or be in possession of drugs shall keep the stock of drugs in his possession stored apart from other goods in a separate room, safe, cupboard or other receptacle which must be kept securely locked when such stocks are not in immediate use.

Medical Practice.**NATIONAL HEALTH ACT.**

THE following notice appeared in the *Commonwealth of Australia Gazette*, No. 70, of December 19, 1957.

NATIONAL HEALTH ACT, 1953-1956.**Notice in Pursuance of Section 134A.**

Notice is hereby given that the Committee of Inquiry for the State of Victoria, after investigation, having reported on the twelfth day of November, 1957, concerning the conduct of Theodore Levick, of 27 Mitchell-street, Brunswick, a medical practitioner, in relation to his provision of Medical Services under Part IV. of the National Health Act, 1953-1956, I, Donald Alastair Cameron, Minister of State for Health, did on the twenty-eighth day of November, 1957, reprimand the said Theodore Levick.

Dated this twenty-eighth day of November, 1957.

DONALD A. CAMERON,
Minister of State for Health.

Australian Medical Board Proceedings.**NEW SOUTH WALES.**

THE following additions and amendments have been made to the Register of Medical Practitioners for New South Wales, in accordance with the provisions of the *Medical Practitioners Act, 1938-1957*:

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1a) of the Act: Bell, Leslie George, M.B., Ch.B., 1919 (Univ. New Zealand); Guthaner, Ernst, M.B., B.S., 1942 (Univ. Adelaide); Lawson, Margaret Elaine, M.B., B.S., 1955 (Univ. Adelaide); Lister, James Dick, M.B., B.S., 1954 (Univ. Adelaide); Milton, Gerald White, M.B., B.S., 1947 (Univ. Adelaide), F.R.C.S. (England), 1951, F.R.A.C.S., 1953.

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (1b) of the Act: Bassett, James Anthony, M.R.C.S. (England), L.R.C.P. (London), 1942, M.R.C.P. (London), 1947; Bates, James, L.R.C.P., L.R.C.S. (Edinburgh), L.R.F.P.S. (Glasgow), 1944; Cook, Wendy Ann, M.B., B.S., 1954 (Univ. London); Danckwerts, Richard Evelyn, M.B., B.Ch., 1942 (Univ. Cambridge), M.R.C.S. (England), L.R.C.P. (London), 1942, B.A., 1939 (Univ. Cambridge); Pallas, David Russell, M.B., B.Ch., 1954 (Univ. Wales), B.Sc., 1951 (Univ. Cardiff); Smith, Peter Hugh Eccles, M.B., Ch.B., 1944 (Univ. Birmingham), F.R.C.S. (Edinburgh), 1948, F.R.A.C.S., 1957; Stoner, John Michael, M.R.C.S. (England), L.R.C.P. (London), 1951.

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2) of the Act: Bogdan, Andrew, M.D., 1945 (Univ. Budapest).

Registered medical practitioner who has complied with the requirements of Section 17 (3) and is registered under Section 17 (2a) of the Act: Joffick, Solomon David, M.D., 1917 (Univ. Yuriev).

Registered medical practitioners who have complied with the requirements of Section 17 (3) and are registered under Section 17 (2b) of the Act: Babicka, Alois, M.D., 1946 (Univ. Prague); Harmos, Gyula Arpad Ferenc, M.D., 1937 (Univ. Pecs); Sirko, Ivan Alexander, M.D., 1930 (Univ. Prague).

Registered medical practitioner who is required to complete twelve months' hospital service, has complied with the requirements of Section 17 (3), and is registered under Section 17 (1a) of the Act: Reynolds, William Slevin, M.B., B.S., 1957 (Univ. Melbourne).

Registered medical practitioners who have been issued with licences under Section 21 (c) of the Act: Kardos, Ida Magdalena, M.D., 1927 (Univ. Pecs); Siroky, Nandor Ferinard, M.D., 1929 (Univ. Budapest); Szeghy, Alexander Gabriel, M.D., 1940 (Univ. Debrecen).

TASMANIA.

THE following have been registered, pursuant to the provisions of the Medical Act, 1951, of Tasmania, as duly qualified medical practitioners: Jarvis, David John Ambrose, M.B., Ch.B., 1942 (Univ. Bristol); Moran, Harold Eldon, M.B., Ch.M., 1924 (Univ. Sydney); Aston, Peter Lennard, M.R.C.S. (England), L.R.C.P. (London), 1955; Tow, Peter Macdonald, M.B., B.S. (London), 1944, Ph.D. (Psychol. Medicine), D.P.M., R.C.P. (London), M.R.C.S. (England), L.R.C.P. (London).

Notice.**THE BRITISH MEDICAL ASSOCIATION ANNUAL GENERAL MEETING, 1955, PRIZE.**

THE British Medical Association Annual General Meeting, 1955, Prize is open to all members of the Association in Australia, its Mandated Territories and in New Zealand, and to any graduate of an Australian university who is a member of the Association.

The prize is to be awarded for that contribution towards the study of problems in the medical and allied sciences adjudged to be of greatest merit. If no contribution be considered to be of sufficient merit, the prize may not be awarded.

The prize shall consist of a medal suitably inscribed, together with the balance of the income from the capital fund available for distribution at the time.

The period during which any contribution for consideration may be made shall be the three years ending on December 31 immediately preceding a meeting of the Australasian Medical Congress (British Medical Association).

This is a triennial prize and it is intended that it may be awarded at the meeting of Congress to be held in Hobart in March, 1958.

To minimize the risk that a contribution of high value may be overlooked, it will be appreciated if the contributor of any such work complying with the above conditions be nominated to the Prize Committee. It is requested that such nominations be forwarded not later than February 1, 1958, to Dr. J. P. Major, Chairman of the Prize Committee, British Medical Association (Victorian Branch), 426 Albert Street, East Melbourne, C.2.

Medical Prizes.**PRIZE FOR A MEDICO-SURGICAL FILM.**

THE annual prize awarded by *La Presse médicale* for a medico-surgical film, amounting to 100,000 francs (with the possibility of its being divided), and various other awards, will be presented during the last session of the course of *Actualités médico-chirurgicales* at the *Faculté de Médecine de Paris* in March, 1958. The judges will consider the instructional value of the film as well as its purely cinematographic quality. Only film of 16 millimetres size will be admitted. Entries and films should be sent before February 15, 1958, to *Secrétariat du journal La Presse médicale*, 120 Boulevard Saint-Germain, Paris VI^e. The authors of the best films will receive awards. Contrary to conditions obtaining in previous years, all films are eligible for awards, including those subsidised or produced by a laboratory or firm.

The College of General Practitioners.

VICTORIA FACULTY.

CLINICAL MEETING AT PRINCE HENRY'S HOSPITAL.

THE honorary staff of Prince Henry's Hospital, Melbourne, in conjunction with The College of General Practitioners, Victoria Faculty, will hold a clinical evening at the hospital on Tuesday, February 18, 1958, at 8.15 p.m. This is the meeting postponed from November 28, 1957. All members of the British Medical Association are invited to be present.

Congresses.

NAPT COMMONWEALTH CHEST CONFERENCE.

FURTHER information relating to the fifth Commonwealth Chest Conference, incorporating the annual conference of the British Tuberculosis Association, has been received from the National Association for the Prevention of Tuberculosis. As was previously announced, the conference will be held at the Royal Festival Hall, London, from July 1 to 4, 1958. The scope of the conference will be much wider than in the past, as the activities of NAPT have been extended to cover diseases of the chest and heart. The programme will include discussions on the prevention of tuberculosis and other chest diseases (lung cancer, bronchitis, asthma, pneumoconiosis etc.) and on the latest clinical developments in treatment. Other sessions will deal with the welfare and rehabilitation of the patient and his family. Commonwealth problems will be given special emphasis, but as chest diseases are a matter of international concern, the speakers will include some of the foremost authorities from many parts of the world, and visitors from all countries will be welcome. An extensive exhibition, to be held in the foyers of the Royal Festival Hall during the conference, will

illustrate, amongst other things, the modern drugs and equipment used in the prevention and treatment of chest diseases. Visits to hospitals and clinics, and tours of general interest will be arranged during the three days immediately following the sessions. Full particulars of the conference can be obtained from the Secretary-General, NAPT, Tavistock House North, London, W.C.1.

INTERNATIONAL FEDERATION OF GYNÆCOLOGY AND 'OBSTETRICS.

THE second world congress of the International Federation of Gynæcology and Obstetrics will take place at Montreal, Canada, from June 22 to 28, 1958. Round table conferences will be held separately in gynæcology and in obstetrics. The subjects are as follows: (i) gynæcology: "The Limits of Pelvic Surgery in the Treatment of Carcinoma of the Cervix", "The Correlation of Psychosomatic Medicine in Ovarian Function", "The Diagnosis of Carcinoma of the Cervix", "Genital Tuberculosis"; (ii) obstetrics: "Psychoprophylactic Preparation for Labour", "Physiology and Pathology of the Contraction of the Human Gravid Uterus", "Anaemia of Pregnancy", "Toxæmia of Pregnancy". Owing to delay in circulating the information bulletin in certain countries, the closing date for application to present a free communication, scientific exhibit or film is extended to January 31, 1958. All correspondence should be addressed to the Montreal Committee, Second World Congress, International Federation of Gynæcology and Obstetrics, 1414 Drummond Street, Suite 220, Montreal 25, Quebec, Canada.

THIRD WORLD CONGRESS OF CARDIOLOGY.

THE third World Congress of Cardiology will be held in Brussels from September 14 to 21, 1958. Applications for membership and for accommodation must be in the hands of the Secretary by March 1. Application forms and further information may be obtained from Dr. James M. Gardiner, Honorary Secretary, The Cardiac Society of Australia and New Zealand, Alfred Hospital, Prahran, S.1, Victoria.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED DECEMBER 14, 1957.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism	3	2(2)	7(1)	..	1(1)	..	..	..	13
Amoebiasis
Ancylostomiasis	1(1)	..	..	..	..	..	..	1
Anthrax	1(1)	..	..	..	..	..	..	1
Bilharziasis
Brucellosis
Cholera
Chorea (St. Vitus)	1	..	..	..	..	..	..	1
Dengue	14(14)	5(4)	..	..	..	..	..	21
Diarrhoea (Infantile)	2(2)	1(1)	..	..	..	..	..	..	1
Diphtheria	1	..	1
Dysentery (Bacillary)
Encephalitis
Filariasis
Homologous Serum Jaundice
Hydatid
Infective Hepatitis	25(16)	14(4)	5	4(4)	11(1)	1(1)	2	..	62
Lead Poisoning	2(2)	..	..	..	..	2
Leprosy	2	..	..	..	2
Leptospirosis	3	..	..	6
Malaria	2	..	..	..	..	..	..
Meningococcal Infection	2	1(1)	3	..	..	2	..	..	8
Ophthalmia
Ornithosis	2(2)	..	..	..	..	..	..	2
Paratyphoid	1	..	1	2
Plague
Polio-myelitis
Puerperal Fever
Rubella	74(42)	4(3)	42(21)	35(30)	..	1	1	157
Salmonella Infection	1(1)	..	..	..	..	..
Scarlet Fever	5(2)	14(13)	4(1)	..	2(1)	1(1)	..	..	20
Smallpox
Tetanus	1	4(3)	..	..	..	..	5
Trachoma	2	..	..	..	2
Trichinosis
Tuberculosis	54(35)	5(2)	54(38)	8(5)	5(3)	5(4)	2	..	133
Typhoid Fever
Typhus (Flea-, Mite- and Tick-borne)	1(1)	..	1	..	1(1)	..	..	..	3
Typhus (Louse-borne)
Yellow Fever

¹ Figures in parentheses are those for the metropolitan area.

Honours.

NEW YEAR HONOURS.

The following medical practitioners have been included by Her Majesty the Queen in the New Year Honours list:

Dr. Herbert Ronald Robinson Grieve, Dr. William George Diamore Upjohn and Dr. Ralph Whishaw have been created Knights Bachelor.

Dr. Harold Crawford has been created a Commander of the Most Excellent Order of the British Empire.

Dr. Leonard Ross Mallen has been created an Officer of the Most Excellent Order of the British Empire.

Nominations and Elections.

The undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Bogdan, Andrew, M.D., 1945 (Univ. Budapest) (registered under Section 17 (2) of the Medical Practitioners Act, 1938-1957), Prince Henry Hospital, Little Bay, New South Wales.

Tippett, George Henry King, M.B., B.S., 1957 (Univ. Melbourne), 12 Pleasant Avenue, North Wollongong, New South Wales.

Mitchell, Lindsay, M.B., B.S., 1955 (Univ. Sydney), 66 Station Street, Bowral, New South Wales.

Pavlovic, Leopold, M.D., 1948 (Univ. Prague), registered in accordance with the provisions of Section 17 (1) (c) of the Medical Practitioners Act, 1938-1957, 96 Wallis Street, Woollahra, New South Wales.

The undermentioned have been elected as members of the New South Wales Branch of the British Medical Association: Chapman, Robert James, M.B., B.S., 1957 (Univ. Sydney); Kennedy, Michael Andrew, M.B., B.S., 1956 (Univ. Sydney); Mackie, Ian John, M.B., B.S., 1956 (Univ. Sydney); Morgan, Gerald John, M.B., B.S., 1956 (Univ. Sydney); Spencer, Owen Lisle, M.B., B.S., 1954 (Univ. Sydney); Toakley, Jean Larry, M.B., B.S., 1956 (Univ. Sydney).

Medical Appointments.

Dr. K. J. B. Davis has been appointed Medical Officer, Department of Health, New South Wales.

Dr. W. R. Hobart has been appointed Medical Officer, Department of State Hospitals and Homes, New South Wales.

Dr. W. R. Barclay has been appointed Medical Officer, Division of Mental Hygiene, New South Wales.

Dr. P. H. Speight has been appointed Medical Officer, Division of Mental Hygiene, New South Wales.

Dr. J. P. van Leent has been appointed Medical Officer, Division of Mental Hygiene.

Deaths.

The following deaths have been announced:

HAYES.—Lawrence Searcy Hayes, on December 19, 1957, at Melbourne.

EVANS.—Wilfred Evans, on December 20, 1957, at Sydney.

DUNHILL.—Thomas Peel Dunhill, on December 22, 1957, in England.

HARRIS.—George Thomas Hamlyn Harris, on December 25, 1957, at Launceston, Tasmania.

WHITE.—Gavin Bruce White, of Vaucluse, on December 30, 1957, at Cabramurra, New South Wales.

GREENHAM.—Eleanor Constance Greenham, on December 31, 1957, at Brisbane.

WADDELL.—Henry James Waddell, on January 3, 1958, at Rockhampton.

REYNOLDS.—Farrell John Reynolds, on January 5, 1958, at Sydney.

Corrigendum.

Dr. Kevin O'Day informs us that there is an error in the reported title of his opening paper read at the meeting of the Ophthalmological Society of Australia (British Medical Association). (See M. J. AUSTRALIA, December 14, 1957, page 883.) The title of his paper was "The True Pathology of the Pigment Epithelium of the Retina", and not as stated in the report of the meeting.

Diary for the Month.

JAN. 10.—Tasmanian Branch, B.M.A.: Branch Council.
JAN. 10.—Queensland Branch, B.M.A.: Council Meeting.
JAN. 16.—Victorian Branch, B.M.A.: Executive Meeting.
JAN. 21.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JAN. 22.—Victorian Branch, B.M.A.: Council Meeting.
JAN. 24.—Queensland Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales. Anti-Tuberculosis Association of New South Wales.

Queensland Branch (Honorary Secretary, 88 L'Estrange Terrace, Kelvin Grove, Brisbane, W.1): All applicants for Queensland State Government Insurance Office positions are advised to communicate with the Honorary Secretary of the Branch before accepting posts.

South Australian Branch (Honorary Secretary, 30 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

Editorial Notices.

ALL articles submitted for publication in this Journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given: surname of author, initials of author, year, full title of article, name of journal, volume, number of first page of the article. The abbreviations used for the titles of journals are those adopted by the Quarterly Cumulative Index Medicus. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary is stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2-3.)

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